TEXAS TECH UNIVERSITY
Vice President *for* Research
Institutional Animal Care and Use Committee

BOX 43132
Animal Care Services
Lubbock, TX 79409
806-834-8588
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July 31, 2019

Dr. Kathryn A. Bayne, Chief Executive Officer
AAALAC – International
5205 Chairman's Court, Suite 300
Frederick, MD 21703

Dear Dr. Bayne,

Texas Tech University is looking forward to the upcoming AAALAC International site visit to evaluate our Animal Care and Use Program. Please find the attached AAALAC, International program description for Texas Tech University. This description is for file number 000956.

We are requesting a visit for November 4th – 6th or November 18th – 20th. As noted on our annual review, we are a very diverse program as we require expertise in agriculture, wildlife, companion animals, and biomedical. We do not have non-human primates or other high risk species or containment areas.

We will require all site visitors to enroll In our Occupational Health and Safety program. Here is the link provided to non-TTU affiliates:
https://ttuovpr.az1.qualtrics.com/jfe/form/SV_cFIIPYMJDaXPIOJ

Please do not hesitate to contact me if you require further information or have any questions concerning the program description for TTU.

Sincerely,

Tiffanie A. Brooks

Tiffanie A. Brooks, DVM, MS, DACLAM
Attending Veterinarian, Director, Animal Care Services

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Program Description
Animal Care and Use Program

Texas Tech System

Box 43132, Lubbock, TX 79409

2019

For
AAALAC International

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Program Description

Instructions for Completing and Submitting the Program Description for the Institutional Animal Care and Use Program

Section 1. Introduction

A. State the name of the program unit and, if applicable, its parent organization. List all organizations (schools, centers, etc.) included within the program unit.

Texas Tech University

B. Give a brief overview of the institution, its purpose and how the animal care and use program relates to the mission of the institution.

Texas Tech University is located in Lubbock, Texas and has the largest graduate and research program between Dallas and central New Mexico. In the area of West Texas, Texas Tech University is the largest and most comprehensive university. Texas Tech University is a Carnegie Tier 1 research university.

Texas Tech University is dedicated to teaching, research, and public service. Texas Tech University has large undergraduate and graduate programs with over 37,000 students. Our students and faculty are advancing the well-being of Texans and the global community. Our students graduate with the practical knowledge and skills necessary to solve problems and meet the challenges of today's work place. The Texas Tech Graduate School offers more than 160 different masters and doctoral degree programs complemented by interdisciplinary programs from 50 specialized centers and institutes. Teaming with award-winning, nationally recognized faculty and utilizing state-of-the-art research facilities, students and staff at Texas Tech are making an impact on the world's most challenging issues — from public health, safety and the environment, to advancements in the scientific frontier.

Texas Tech recognizes the value in humane animal research as it relates to enhancement of the human and animal condition. Thus, Texas Tech is firmly committed to the ethical and humane use of animals in research in order to bring about solutions to significant human and environmental problems.

C. Note that AAALAC International's three primary standards are *the Guide for the Care and Use of Laboratory Animals* (*Guide*), NRC, 2011; the *Guide for the Care and Use of Agricultural Animals in Research and Teaching* (*Ag Guide*), FASS, 2010, and the European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes, Council of Europe (ETS 123). Other regulations and guidelines used (U.S. Department of Agriculture (USDA), Public Health Service (PHS)

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Policy, Good Laboratory Practice (GLP), Canadian Council on Animal Care (CCAC), etc.) may also apply. Describe which of the three primary standards and other regulations and guidelines are used as standards for the institutional animal care and use program and how they are applied. For example, an academic institution in the United States with an Office of Laboratory Animal Welfare (OLAW) Assurance may use the standards of the *Guide* and PHS Policy for all animals, the Animal Welfare Act regulations for covered species, and the *Ag Guide* for agricultural animals used in agricultural research and teaching (see also *Guide*, pp. 32-33). In the European Union, the standards applied might be the *Guide*, ETS 123, Directive 2010/63, and any country-specific regulations.

Texas Tech University follows the Guide for the Care and Use of Laboratory Animals (Guide), NRC, 8th edition 2011 for biomedical-related animal activities and the Guide for the Care and Use of Agricultural Animals in Research and Teaching (Ag Guide), FASS 2010, for agriculture-related animal activities. Additionally, we comply with regulations and guidelines outlined by PHS and the AWA.

D. Describe the organization and include an accurate, current, and detailed organizational chart or charts (see **Appendix 4**) detailing the lines of authority from the Institutional Official to the Attending Veterinarian, the Institutional Animal Care and Use Committee/Oversight Body (IACUC/OB), and the personnel providing animal care. Please include the title, name (*Note:* For individuals whose information is publically available, provide the titles and names; for individuals whose information is not publically available, you may provide titles only.), and degree (if applicable) of each individual at the level of supervisor or above. Names of animal care staff below the title of supervisor need not be included, but the titles and number of animal care personnel under each supervisor should be included. If animal care responsibility is administratively decentralized, including the management of satellite housing areas/locations, the organizational chart or charts must include all animal care programs, indicating the relationship between each administrative unit and personnel, the Attending Veterinarian, and the Institutional Official.

A Board of Regents and Chancellor Dr. Ted Mitchell administer the Texas Tech System which includes Texas Tech University, Texas Tech University Health Sciences Center, Texas Tech University Health Sciences Center El Paso, and Angelo State University. Each institution has its own president and is organized as a separate institution with separate Chief Executives. This application is for Texas Tech University. One of our sister institution's, Texas Tech University Health Sciences Center (TTUHSC), is also accredited by AAALAC International. An organizational chart is included as Appendix 4.

E. Identify the key institutional representatives (including, but not limited to, the Institutional Official; IACUC/OB Chairperson; Attending Veterinarian; animal program manager; individual(s) providing biosafety, chemical hazard, and radiation safety oversight; etc.); and individuals anticipated to participate in the site visit.

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The CEO of Texas Tech University is Lawrence Schovanec, PhD, President. He designated responsibility to Joseph Heppert, PhD, Institutional Official (IO). The IACUC and the Attending Veterinarian report to the IO. The Attending Veterinarian also serves as the Director of Animal Care Services. The laboratory animal care staff report to the Director of Animal Care Services. Academic departments report to academic deans and the dean's report to Michael Galyean, PhD, Provost. The Provost reports to the President. Phil Smith, PhD chairs the Institutional Animal Care and Use Committee. The University's Attending Veterinarian is Tiffanie Brooks, DVM, DACLAM, the University's Clinical Veterinarian is Paul Stonum, DVM, and the Consulting Veterinarian is Bradford Goodwin, DVM, DACLAM. The Director of Animal Care Services reports to Alice Young, PhD, the Associate Vice President for Research, Office of Responsible Research. The above personnel will be available for consultation during the AAALAC site visit, and most will participate. Other persons involved with biosafety, chemical safety, and radiation safety are as follows: Kendra Nightingale, PhD – Chair of Institutional Biosafety Committee, Dimitri Pappas, PhD – Chair of Institutional Laboratory Safety Committee, and Llewellyn Densmore, PhD – Chair of Radiation and Laser Safety Committee. These individuals also report to the Associate Vice President for Research, Office of Responsible Research and can be invited to participate in the site visit as needed

F. Briefly describe the major types of research, testing, and teaching programs involving animals and note the approximate number of principal investigators and protocols involving the use of animals. As mentioned in the instructions, please complete **Appendix 5** (Animal Usage) or provide the information requested in a similar format as an Appendix.

Texas Tech University has approximately 75 faculty principal investigators and instructors, and over 550 active individuals approved to work with animals. We have over 200 approved protocols. Approximately 25% of the protocols are for laboratory animals, 35% are for wildlife, 25% are for farm animals, and 15% are for companion animals. Of the approved protocols approximately 18% are being used for teaching purposes. Appendix 5 lists the animal usage at TTU.

G. Note the source(s) of research funding (grants, contracts, etc.) involving the use of animals.

Texas Tech University is the recipient of research funding from both state and federal agencies, private company sponsorship, associations and foundations, and various donors. A few examples include The National Institutes of Health, The National Science Foundation, United States Department of Agriculture, United States Geological Survey, Department of Interior, Department of Energy, United States Fish and Wildlife Service, Texas Parks and Wildlife Department, American Heart Association, Merck Animal Health.

H. List other units (divisions, institutes, areas, departments, colleges, etc.) of your organization that house and/or use animals that are not included in this Description. If

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any of these are contiguous, physically or operationally (e.g., same IACUC/OB, same animal care staff), with the applicant unit, describe the association. Explain why such units are not part of this program application.
Note: Questions regarding this section should be forwarded to the AAALAC Office.

Texas Tech University has three other academic colleges that are not included in this description because, at this time, they do not use animals. They include colleges of Law, Mass Communications, and Architecture. The Texas Tech University Health Sciences Center is a sister institution with its own IACUC and AAALAC, International Accreditation. All Colleges that use animals at TTU are part of the accredited program and are included in this Description.

I. Contract Facilities: If the institution contracts for animal care facilities or services for animals owned by the institution, the contractor and its AAALAC International accreditation status must be identified. If a contractor's animal care and use program is not accredited by AAALAC International, a brief description, following this Program Description outline, of the relevant contractor's programs and facilities must be provided. In addition, the species and approximate average number of animals housed in the contract facilities and the approximate distance between the institution's animal facility and the contract facility must be noted. Incorporation of the contractor program into the site visit schedule will be discussed with institutional representatives. If the institution does not contract for animal care facilities or services, so note.

At this time, Texas Tech University has no contract facilities.

J. Note other relevant background that will assist reviewers of this report.

N/A

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Section 2. Description

I. Animal Care and Use Program

A. Program Management

1. Program Management Responsibility [*Guide*, pp. 13-15]

a. The Institutional Official [*Guide* pp. 13-14]
Describe how program needs are clearly and regularly communicated to the Institutional Official by the Attending Veterinarian, IACUC/OB, and others associated with the program.

The IACUC Coordinator, IACUC Chair and AV communicate with the IO at least monthly during a meeting, as well as semiannual reports, memorandums to request specific program or training needs, and electronically. The IO visits IACUC meetings to communicate University activities or institutional changes. The AV is also the Director of Animal Care Services. This individual conducts monthly rounds at all facilities. The monthly round reports are distributed to all appropriate individuals, which include the IO, VP for Research Integrity & Innovation, IACUC Chair, Post Approval Monitor (PAM), and IACUC Coordinator. The IO, AV and the IACUC Coordinator communicate often (most days) by e-mail, phone and in person. The IO is available as needed to discuss programmatic needs with the AV and IACUC Chair. In addition, the AV meets monthly with the Associate Vice President for Research in the Office of Responsible Research, the Assistant Vice President of Environmental Health and Safety, the Assistant Vice President of Operations and the Animal Care Services staff.

b. Role of the Attending Veterinarian [*Guide*, p. 14]

i. Describe the institutional arrangement for providing adequate veterinary care. Although individual name(s) and qualifications will be described below, identify by title the veterinarian(s) responsible for the veterinary care program, including:
- a list of responsibilities
- a description of the veterinarian's involvement in monitoring the care and use of laboratory animals
- the percentage of time devoted to supporting the animal care and use program of the institution if full-time; or the frequency and duration of visits if employed part-time or as a consultant.
  Note: If preferred, this information may be provided in a Table or additional Appendix.

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The Attending Veterinarian is Tiffanie Brooks, DVM, DACLAM. She initially served as the Clinical Veterinarian from 2007-2008 and transitioned to AV in September, 2008. Dr. Brooks was in private practice for 8 years focusing on both large and small animal medicine and surgery. She has focused her time since 2008 on laboratory animal medicine, and received her DACLAM certification in 2013. Because of her experience with large animal species and now lab animal species, she is able to provide veterinary care for the entire TTU program. She is a voting member of the IACUC and Institutional Biosafety Committee (IBC). She is also the director of Animal Care Services (ACS) and oversees daily activities.

The Clinical Veterinarian is Paul Stonum, DVM. Paul spent 20 years in rural mixed animal practice. He is a full voting member of the IACUC and Associate Director of ACS.

Name of veterinarian(s)	**If full time, indicate time dedicated to animal care and use program**	**If part time/consultant, indicate frequency and duration of visits**
Tiffanie Brooks, D.V.M., DACLAM	100%	Attending Veterinarian, Director ACS
Paul Stonum, D.V.M.	100%	Clinical veterinarian, Associate Director, ACS
Bradford Goodwin, D.V.M., DACLAM		Consultant- Min 2 visits/year
Bo Brock, D.V.M.		Approved Emergency Veterinarian
Alecsya Broyles, D.V.M.		Approved Emergency Veterinarian
Brandon Broyles, D.V.M.		Approved Emergency Veterinarian
Louis L. Farr, D.V.M.		Approved Emergency Veterinarian
John A. Hill, D.V.M.		Approved Emergency Veterinarian
Frank Griffin, D.V.M.		Approved Emergency Veterinarian
Kody Kothman, D.V.M.		Approved Emergency Veterinarian

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Edward “Bud” Johnston, D.V.M.	Approved Emergency Veterinarian
Taylor Chattin, D.V.M	Approved Reptile/Exotics Veterinarian
Scott Trasti, DVM TTUHSC AV and LARC Director	Periodic Protocol Review; Back-up emergency lab animal care

ii. List others (e.g., Principal Investigators, veterinarians serving as Principal Investigators, veterinary faculty/staff, technical staff, farm managers) who have a *direct role in the provision of veterinary care* and describe their responsibilities. The Organizational Chart(s) provided in **Appendix 4** must depict the reporting relationship between these individuals and the Attending Veterinarian.
Note: If preferred, this information may be provided in a Table or additional Appendix.

Position Title	**Responsibility**
Tiffanie Brooks, DVM, DACLAM	Attending Veterinarian; responsible for health and well-being of all research and teaching animals at TTU Reports to VP Research Integrity
Paul Stonum, DVM	Clinical Veterinarian; responsible for clinical care of research and teaching animals at TTU Reports to Director ACS
Sydnee Woodman, B.S., RLATG	Facilities manager and assistant to veterinary staff Reports to Director ACS
Brittany Backus, PhD.	Post Approval Monitor Reports to Director ACS
Kim Lindsey	Director of TTEC Reports to AFS Dept Chair
Tangi Irwin	Director of TTRC Reports to AFS Equine Faculty
Stanley Harris	Manager at TTU Swine Center Reports to AFS Swine Faculty
Kirk Robinson	Manager at Burnett Center Reports to AFS Nutrition Faculty

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Michael Looney	Manager at Beef Center Reports to AFS Faculty member
Sam Jackson	Manager at Sheep Center Reports to AFS Dept Chair
Matthew McEwen	Manager at Quail Tech Reports to NRM Faculty

c. Interinstitutional Collaborations [*Guide*, p. 15]
Describe processes for assigning animal care and use responsibility, animal ownership and IACUC/OB oversight responsibilities at off-site locations for interinstitutional collaborations.

TTU policy requires animals used in research and teaching to be approved by the IACUC. In some cases, the animals are owned by others and they are kept in TTU facilities (these are covered as any other protocol, except privately-owned boarding animals, i.e. horses). In other cases, the facility and animals are not owned by TTU (ex., dog shelter). In particular scenarios, the IACUC may have a written memorandum developed and signed by appropriate, authorized institutional representatives in situations where collaborative animal use activities involving off-site facilities occur. These written documents delineate animal care responsibilities and institutional ownership of animals. Offsite, non-TTU facilities containing TTU-owned animals/animal activities are inspected by the TTU IACUC members, and at least semiannually by means of video or photographic inspection.

2. Personnel Management

a. Training, Education, and Continuing Educational Opportunities
Describe *how* the IACUC/OB provides *oversight* and *evaluates the effectiveness* of training programs and the assessment of personnel competencies. Describe how training is documented.
Note: Do not include details about the training program, which should be described in the following sections.

All personnel involved with animal care and use at TTU must be trained in the requirements for the ethical and humane use of animals. Regardless of prior experience, all personnel involved in the TTU animal care and use program are required to review the information and pass the quiz for the online "generic training" (http://www.depts.ttu.edu/iacuc/training/Generic_Training/Online_Generic_Training/index.htm) seminar. This seminar presents the current laws, regulations, guidelines and policies concerning the use of live animals, ethical considerations of animal research and occupational health and safety at Texas Tech University. Upon completion of training, electronic copies of training documents are filed in the IACUC Office. From these documents, an electronic training database has been developed and is maintained to keep training records of all animal

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users. Training records of all personnel listed on animal use protocols are checked against the database prior to protocol approval to ensure that listed animal users are properly trained.

IACUC members are trained by the IACUC Chair once their membership is appointed, which prepares them for their duties. Members are also provided with opportunities to attend webinars and conferences (iCARE and SCAW) to further their IACUC education. All trainings completed for IACUC members are noted in their training file located in the IACUC Office. Members also receive training opportunities during the IACUC monthly meetings, for example, protocols may be selected as a training exercise for FCR and during the PAM report when hands-on activities of approved protocols are shown.

Additionally, PIs and personnel listed on approved protocols are asked to read, acknowledge, understand, sign, and initial a signature documentation form that may be included in the study notebook. This helps ensure personnel on approved protocols have been properly trained to know which procedures are approved in the protocol.

Species-specific, hands-on training is provided by the Attending Veterinarian, Training Coordinator, and/or other Animal Care Staff when needed for specialized lab animal protocols. The ACS staff may also provide online videos (e.g. Jove) and CITI trainings, before a training session. These videos and trainings are helpful by providing the trainee an initial understanding of the procedure and general information working with the species. The specialized, hands-on training is documented, and records are maintained in the IACUC office. The Attending Veterinarian and Animal Care Staff are also frequently (at least monthly) involved in Post Approval Monitoring to evaluate procedural competency and proficiency. Species-specific training may also be conducted by the PIs or their staff.

Finally, TTU provides the Collaborative Institutional Training Initiative (CITI) Program opportunity to all personnel that work with animals. A list of all trainings and instructions are provided to each PI when a protocol or an amendment is approved. The most relevant CITI trainings are checked for the PI on the list they receive. CITI training may also be used as introductory training before species-specific training and during re-training.

i. Veterinary and Other Professional Staff [*Guide*, pp. 15-16]

For the Attending Veterinarian and other individuals having a direct role in providing veterinary medical care (veterinarians, other professional staff listed above, private practitioners, etc.), provide: name, credentials (including degrees), and a description of their qualifications, training, and continuing education opportunities.

Note: Please do not provide curriculum vitae of personnel; if preferred, this information may be presented in a Table or additional Appendix.

Name/credentials	Describe qualifications, training, continuing education

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Tiffanie Brooks, D.V.M., Attending Veterinarian Director, Animal Care Services	• DACLAM Certified 2013 • Member of AVMA, ASLAP, AALAS, TSBR Board Member • B.S., M.S., Texas Tech University, Animal Science • D.V.M. Texas A&M University • Texas accredited licensed veterinarian • Charles River Short-Course 2011 • Workshop in Lab Animal Medicine-North Carolina 2012 • National AALAS meetings 2007, 2009, 2010, 2013, 2015, 2016, 2017, 2018 • Pathology of Lab Animals Course- Blacksburg, VA, 2012 • IACUC 101 2007, 2018 • ICARE Academy 2019 • AAALAC Ad Hoc specialist
Joseph Heppert, PhD, Institutional Official	• B.S. Chemistry, San Jose State University • Ph.D. Inorganic Chemistry, University of Wisconsin-Madison • Postdoctoral training, Indiana University • Previously IO at Kansas University for several years
Brittany Backus, PhD Post-Approval Monitor	• B.A., Texas Tech University, Biochemistry • M.S., Texas Tech University, Interdisciplinary Studies • Ph.D., Texas Tech University, Animal Science: Animal Welfare and Comparative Medicine • National AALAS meetings 2013, 2014, & 2015 • SCAW meetings 2014, 2017 • IACUC 101 Oct 2018 • ICARE Academy 2019
Paul Stonum, D.V.M. Clinical Veterinarian	• B.S., Texas Tech University, Animal Science • D.V.M., University of Missouri-Columbia • Texas accredited licensed veterinarian • Member of AVMA and AABP • National AALAS meetings 2013, 2014, 2015, 2016, 2017
Karin Fritz, M.S., CPIA IACUC Coordinator	• Certified Professional IACUC Administrator • B.S., M.S., Texas Tech University • Poster Presenter on Occupational Health and Safety Program at PRIM&R's 2014 Conference • Attends PRIM&R and IACUC workshops (IACUC 101, 301 & Essentials of IACUC Administration)
Sydnee Woodman, B.S., RLATg On-Campus Facilities Manager	• B.S., Texas Tech University, Zoology • MLAS, Eastern Virginia Medical School • RLATG Certified • 6 years clinical veterinary technician experience/4 years laboratory animal experience

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- Poster Presenter on Signage (3rd place winner at National AALAS 2017)
- Member of AALAS and TBAALAS
- ICARE Academy 2019
- National AALAS meeting- 2015, 2016, 2017, 2018
- IACUC 101- 2016, 2018
- SCAW Meeting- 2015
- Charles River Short Course June 2015

ii. Animal Care Personnel [*Guide*, p. 16]

1) Indicate the number of animal care personnel.

ACS – Care of 4 on-campus facilities (ESB I & II, Biology, HSB and AFS). Three full-time technicians, 2 student workers.
New Deal Dog facility- 1 full time faculty member; 5 graduate students ; 9 undergraduate students
TTU Swine Center- Two full time unit managers; 1 student worker
TTU Burnet Center- Two full time unit managers; 2-3 student workers
TTU Beef and Sheep Center- 1 full time unit manager; 1-2 student workers
TTEC- 1 full time director; 1 full time administrative assistant; 1 part time caretaker; 3-4 student workers
TTRC- 2 full time unit managers; 2 part time; 8 student workers
Erskine- 2 full time technicians, 5 graduate students, 5 undergraduate students
TIEHH- 1 full time; 2 faculty; 4 graduate students
Deer- 3-4 graduate students

2) Summarize their training, certification level and type, experience, and continuing education opportunities provided.
Note: If preferred, this information may be provided in a Table or additional Appendix.

- Mark Goza
  - RALAT Certified
  - Lab Animal Technician 15+ years experience
  - On-the-job training conducted on an ongoing basis
  - Attends AALAS (2007) and Texas Branch AALAS Conferences
  - Member of AALAS and TBAALAS
  - Webinars

- Veronica Vasquez
  - RLATG Certified
  - Training Coordinator and Breeding Manager 6 years experience

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- Rodent breeding specialist
- On-the-job training is conducted on an ongoing basis
- Webinars
- National AALAS meeting 2017
- Texas Branch AALAS Conference 2019
- Member of AALAS and TBAALAS
- Training Coordinator training University of Michigan (ULAM) 2019

- Michael Chandler
  - RALAT Certified
  - Lab Animal Health Technician 3 year experience
  - On-the job training is conducted on an ongoing basis
  - National AALAS meeting 2017
  - Member of AALAS and TBAALAS
  - Webinars
  - Biomedical Swine Husbandry training with UT-Southwestern Animal Resource Center

- Kirk Robinson
  - Burnett Center Unit Manager (Feed yard cattle)
  - Responsible for animal care at the Burnett Center and for feed manufacturing for all agriculture and wildlife (deer) animals
  - B.S., M.S. Texas Tech University, Animal Science
  - 28 years' experience in managing and care of feed yard cattle

- Ricardo Rocha
  - Livestock Supervisor II
  - Responsible for care of cattle at the Burnett Center and for feed manufacturing
  - 26+ years of experience in the care of feed yard cattle

- Stanley Harris
  - Swine Center Unit Manager (Swine)
  - Responsible for animal care at the Swine Center and for supervision of one staff member and student assistants
  - B.S. Texas Tech University, Agricultural Education
  - 39+ years of experience in the care and management of swine

- Edward Carrasco
  - Technician III
  - Responsible for care of pigs at the Swine Center
  - 29+ years of experience in the care of swine

- Michael Looney
  - B.S. in University Studies from Texas Tech University
  - Unit Manager for the Beef Unit

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- Responsible for cattle care and management at the Beef Center
- Born and raised on a cattle farm with 6 years of managerial experience

- Paul Green
  - B.S. in University Studies from Texas Tech University
  - Unit Manager for Plant and Soil Sciences
  - Responsible for cattle in field for Plant and Soil Sciences.
  - 15+ years working with cattle in a research setting

- Tangela Arant
  - Program Director TTRC
  - Responsible for care of equine at TTRC.
  - Advanced Certification Therapeutic Riding Instructor through PATH, Intl.
  - M.S. Texas Tech University, Animal Science
  - 20+ years experience with equine

- Kim Lindsey
  - Director TTEC
  - Responsible for care of equine at TTEC.
  - B.S.
  - 30+ years experience with equine

- Matthew McEwen
  - Facilities Manger
  - M.S. from Texas Tech University in Range Science
  - Responsible for care of quail at the NRM Quail Barn
  - 3+ years of experience working with quail

- Mike Wages,
  - Research Assistant
  - Responsible for care of amphibians, fish, rodents at TIEHH
  - 15+ years of experience in animal research and animal care

- Nathan Hall
  - B.S., M.S. & Ph.D. from the University of Florida
  - Faculty member responsible for the care of dogs at New Deal Dog facility
  - 9 years of experience working with companion animals research
  - 6 years of experience working with companion animals in veterinary medicine

iii. The Research Team [*Guide*, pp. 16-17; 115-116; 122; 124]

1) Describe the *general mechanisms* by which the institution or IACUC/OB ensures that research personnel have the necessary knowledge and

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expertise in the animal procedures proposed and the species used.

A summary of the qualifications and experience of each individual identified in the IACUC protocol is reviewed by the IACUC during the protocol review process. Personnel listed on animal use protocols are required to be trained in the ethical and humane use of animals and are expected to be competent in handling and manipulating animals. Regardless of prior experience, all personnel involved in the TTU animal care and use program are required review the information and pass the quiz for the online "generic training" (http://www.depts.ttu.edu/iacuc/training/Generic_Training/Online_Generic_Training/index.htm) seminar. This seminar includes training on the following topics: animal care and use legislation, IACUC function, reporting concerns, occupational health and safety, ethics and concepts of animal use, the 3-R's, handling, aseptic technique, anesthesia/ analgesia, and euthanasia. Principal Investigators must be a faculty member, have a Ph.D. or equivalent degree, or be experts in a particular animal field (examples: rodeo coach, equestrian center manager), as well as have experience conducting animal research or using animals for teaching purposes. Based on research team expertise, species-specific training may be required and is offered through the Attending Veterinarian and/or Animal Care Services (Training Coordinator) for research groups working with lab animals. For livestock and wildlife species, students and staff are generally trained by highly experienced principal investigators or animal care unit managers. Our veterinarians have approved animal use training protocols for both laboratory animals and livestock species. A wildlife veterinarian is consulted on projects requiring specialized care for wildlife species. The CITI training program is also available and encouraged to all personnel that work with animals. If post-approval monitoring reveals incompetency in any animal procedure, then re-training would be warranted.

a) Briefly describe the content of any required training.

All investigators, undergraduate students, graduate students, IACUC members and technicians/staff that utilize live animals, regardless of prior experience are required to review information and pass the quiz for the online "generic training" (http://www.depts.ttu.edu/iacuc/training/Generic_Training/Online_Generic_Training/index.htm) seminar. This seminar includes training on the following topics: animal care and use legislation, IACUC function, reporting concerns, occupational health and safety, ethics and concepts of animal use, the 3-R's, handling, aseptic technique, anesthesia/ analgesia, and euthanasia. Procedures for completing and submitting an Animal Use Protocol, Protocol Amendments, and Annual Reports are also discussed. Additionally, individuals must receive species-specific training from their PI or ACS (Training Coordinator).
Species-specific training would focus on the required species for a particular protocol and may involve handling and restraint, rodent procedures (blood collection, injection techniques, gavage), rodent anesthesia, euthanasia and rodent necropsy. These specific trainings are conducted on an as needed basis. In addition, the facilities manager will conduct specific facility trainings such as our card system, ABSL-2 and PPE use. The AV conducts lecture style trainings, such as Mouse Biomethodology and Animal Welfare and Ethics, annually to lab groups that make a request.

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Other University training may be required such as Radiation Safety, Laboratory Safety, and Chemical Hygiene.

b) Describe the timing of training requirements relative to the commencement of work.

Generic Animal Care and Use Training and OHS risk assessment must be completed prior to handling any animals within the project. This training is available to all individuals online. Additionally, they must receive species-specific training from their PI or ACS. If any person who has completed generic training is not involved in animal use activities for a period of three years, they are required to be retrained, and are not permitted to submit a protocol or participate in any animal-related activities until they are retrained. If any species-specific training is needed, training is conducted prior to animal use. If ACS conducts training, training records are kept with the IACUC Coordinator and Facilities Manager.

c) Describe continuing education opportunities offered.

Generic training is available to all individuals online. Each new animal worker/user must review the generic training http://www.depts.ttu.edu/iacuc/training/Generic_Training/Online_Generic_Training/index.htm information and pass the quiz, which includes information on animal care and use and occupational health and safety. New IACUC members are trained during a one-on-one session with the IACUC Chair. These training sessions are documented on a training documentation form which is kept on file in the IACUC office. IACUC members are encouraged to undergo additional training as new information becomes available. Members are sent to conferences such as IACUC 101 & 201, SCAW, PRIM&R, iCARE, and National AALAS meetings. The AV and CV are required to receive 17 hours of continuing education credits annually to maintain their licenses. They attend veterinary or laboratory animal medicine short courses or conferences throughout the year. The IACUC Coordinator attends PRIM&R conferences for training purposes. ACS staff typically attends TBAALAS (Texas Branch) or National AALAS meetings, webinars and lunch & learns (AAALAS, Jackson Labs, Charles River). Applicable webinar events (Jackson Lab, OLAW, USDA, NABR, SUBR) are offered to IACUC members throughout the year. Some of these have included, Infiltrations-The Insider Threat, Reducing Burden: Options and Opportunities, Discussion- Biomedical Research with the Public. Occasionally vendors such as Charles River offer inter-institutional lunch and learn opportunities for animal care staff. Finally, all personnel that work with animals are provided with the CITI training program opportunities.

2) Describe the process(es) to ensure surgical and related procedures are performed by qualified and trained personnel, including:

- who determines that personnel are qualified and trained for surgical procedures
- the roles that the Attending Veterinarian and IACUC/OB have in this determination [*Guide*, pp. 115-116]

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A project that involves surgery is considered a team effort. Pre-surgical planning includes the PI, surgeon, veterinarian, surgical staff, and animal care staff. All members of the team know their role and are properly trained to perform that role. All individuals performing surgery must have experience with the proposed procedure or training and verify their qualifications on the "Animal Use Form". Thus, the IACUC and AV are involved before protocol approval in evaluating the experience of the surgical team. Individuals involved that are not experienced in surgical techniques will receive proper training by the AV, animal care staff or principal investigator. Individuals involved receive proper training to ensure good surgical technique, which may include, asepsis, gentle tissue handling, minimal dissection of tissue, appropriate use of instruments, effective hemostasis and the correct use of suture materials and patterns. All individuals performing surgery must have training and verify their qualifications on the "Animal Use Form". If a surgical procedure is proposed that the veterinarian and/or the investigator are not qualified to perform, then training is sought from outside the institution. The veterinarian conducts training for basic surgical techniques to investigators and their technicians followed by assistance during the surgery. Currently, TTU has only a few protocols that involve surgery.

3) Describe the training and experience required to perform anesthesia. [*Guide*, p. 122]

The AV or CV is involved with assisting the PI in the formulation of anesthetic and analgesic regimens for protocols requiring anesthesia and/or analgesia and reviews all protocols that involve anesthesia and/or surgery. The AV and/or facilities manager provides training in proper administration of drugs, whether injectable or gas anesthesia. When possible, the veterinarian(s) or facilities manager is present when gas anesthesia is used for surgical purposes. For rodent anesthesia, research groups are trained in the use of the anesthetic equipment and in proper monitoring of the anesthetized animal. PI's must be experienced or properly trained in the proposed surgical procedure.

4) Describe how the proficiency of personnel conducting euthanasia is ensured (especially physical methods of euthanasia). [*Guide*, p. 124]

Individuals performing euthanasia are required to be trained or experienced in performing the procedures. Training for euthanasia is provided by ACS staff or the Principal Investigator. When controlled chemical agents are required for euthanasia, the AV or facilities manager always administers this agent, unless the PI holds his/her own DEA license and is able to obtain the chemical and it is the approved method of euthanasia in their protocol. Investigators must be experienced or trained in the use and administration of CO2 or Isoflurane for euthanasia. For rodents, a physical method of euthanasia always follows an inhaled agent method to ensure death. If a physical method of euthanasia is the only means of death, then this must be justified and approved by the IACUC. In some livestock species, physical methods may be the recommended method of euthanasia (e.g. gunshot to the head) and is performed by experienced farm managers. The IACUC evaluates the individual's experience and may require additional training with animal care staff.

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b. Occupational Health and Safety of Personnel [*Guide*, pp. 17-23]

i. Institutional Oversight [*Guide*, pp. 17-19]

1) List the institutional entities (units, departments, personnel, *etc*.) that are involved in the planning, oversight, and operation of the institutional occupational health and safety program related to animal care and use (e.g., office(s) of environmental health, institutional health services or clinics (*including contracted health services*), industrial hygienists, Institutional Biosafety Committee(s) and/or Officer(s), Radiation Safety Committee(s) and/or Officer(s).

- Include a brief description of their responsibilities and qualifications.
- If contracted services are used, also include their location (e.g.,remote offices to which personnel must report).

Planning:
IACUC OH&S sub-committee (AV, IACUC Chair, IACUC Coordinator)
IACUC
IO
Office of Vice President for Research & Innovation (Research Integrity)
Occupational medicine providers
Risk Assessment Reviewers
Allergist
Wildlife Veterinarian
Laboratory Animal Veterinarian
Occupational Medicine Physician
Attending Veterinarian

Reassessment of Program:
IACUC OH&S sub-committee (AV, Chair, Coordinator)
IACUC
IO
Office of Vice President for Research & Innovation (Research Integrity)
Occupational medicine providers
Risk Assessment Reviewers
Attending Veterinarian
Assistant Vice President of Environmental Health and Safety
Occupational Medicine Physician (Visited TTU to Reassess High Risk Facilities)

Oversight:
IACUC
Office of Vice President for Research & Innovation (Research Integrity)
University Counsel

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Occupational Medicine Group (provider)- OccMed- Lubbock, TX
Environmental Health and Safety

Operation:
IACUC
Environmental Health and Safety
Occupational Medicine Associates (provider)- OccMed- Lubbock, TX
IACUC Coordinator
Office of Vice President for Research & Innovation (funding)

The IACUC is responsible for ensuring that there is an effective Occupational Health Program for the Animal Care and Use Program.

Environmental Health and Safety (EHS) is responsible for the overall safety of personnel at TTU in terms of physical, chemical and biological hazards.

Institutional Biosafety Committee (IBC) is responsible for the proper and safe use of biological hazards.

Local Contracted health services- OccMed, Lubbock, TX- is responsible for providing occupational health services including risk assessment, vaccinations (Tetanus, Rabies), respirator clearance, medical evaluation and medical treatment.

2) Describe methods to identify work-related hazards and the processes used to evaluate the significance of those hazards in the context of duties and tasks. Describe both common approaches and differences, if applicable, for categories of personnel such as, but not limited to, researchers, veterinarians, husbandry staff, cage-washing staff, students, housekeeping, physical plant staff, security personnel, IACUC/OB members (including non-affiliated members), contractors, visitors, etc. [*Guide*, pp. 18-19; see also Chapters 2 and 3 in Occupational Health and Safety in the Care and Use of Research Animals, NRC 1997.].

Risks associated with proposed animal use activities (including experimental hazards) are identified and mitigated during protocol formulation and the review process. The TTU Animal Use Form (see Appendix 9) queries animal users for potential hazards including radiation, biological hazards (pathogens), toxic chemicals, and controlled substances. Once identified, animal users are directed to the appropriate safety committees for approval of proposed use of hazards and training. Animal Use Protocols will not be approved by the IACUC prior to approval from appropriate safety committees (e.g. IBC, ILSC, RLSC).

The Radiation and Laser Safety Committee oversees personnel that are involved with equipment or procedures that emit radiation or lasers. If animal work is proposed that

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involves ionizing radiation or radioisotopes, then the individual must apply for a Radioactive Material (RAM) or Laser Equipment Sublicense or be added to an existing sublicense.

For animal-specific hazards, risks are evaluated for individual users following guideline delineated in the TTU Animal User Risk Assessment. The TTU animal user risk assessment document (Appendix 6) was revised by the IACUC OH&S subcommittee in 2012 in response to the new ILAR Guidelines, reassessed at the beginning of 2016, and was re-evaluated in 2017. That document was originally refined by a select group of Risk Assessment Reviewers including an Allergist, Wildlife Veterinarian, Laboratory Animal Veterinarian, Occupational Medicine Physician, and the Attending Veterinarian. During the reassessment of the program our OH&S program (the Risk Assessment) was reviewed again by our occ-med physician, Assistant Vice President of Environmental Health and Safety, and the AV. In addition, an occ-med physician visited TTU in January 2016 to reassess all high-risk facilities. Considerations included past, current, and future animal use activities at TTU. The risk assessment document was reviewed for completeness and revised according to reviewer recommendations. The revised document is on file in the IACUC office. It has been converted to a web-based program (Web-based Risk Assessment Program; WRAP) designed to evaluate risks to animal users on a yearly basis. The web link is: 2018-2019 Non-TTU OHS. In 2017, the IACUC implemented the pre-exposure vaccinations policy (Policy 23), which was also reviewed by the AV, Occ-Med Physicians, and Assistant Vice President of Environmental Health and Safety.

Initially and then annually, all animal users are required to take the web-based OH&S Risk Assessment through a Qualtrics survey, and personnel involved in PHS funded research also enroll in the Occupational Health Program through TTU Environmental Health and Safety provided by Occupational Medicine Associates. All animal users are offered to participate in a health risk assessment, but those personnel involved in PHS funded research must complete a risk assessment form (Appendix 6) that is reviewed by OccMed (OHS provider).

The OH&S program is reviewed during the Semiannual Program Review, and the Assistant Vice President of Environmental Health and Safety is present.

Specific training and guidelines for prevention of common zoonoses pertaining to the animals involved in animal use activities are provided to the PI at the time of protocol approval, amendment approval, annual review and progress report approval, when completing their annual OH&S assessment, and posted on the IACUC web page.

Guidelines in the TTU risk assessment document (Appendix 6) include but are not limited to:

- Hearing protection
- Vaccination recommendation
- Personal Hygiene
- PPE
- Respiratory Protection Program
- Allergens
- Species appropriate training

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- Zoonosis
- Equipment appropriate training
- Physical hazards

3) Describe methods and frequency of reassessing work-related hazards.

The web-based Risk Assessment Program and Occupational Medicine Associates provider (for personnel involved in PHS funded research) are used to reassess work-related hazards on an annual basis for personnel both directly (e.g. investigator, students, animal husbandry staff) and indirectly (e.g. physical plant staff) exposed to potential hazards. The IACUC conducts semi-annual inspections and evaluates facilities and working environments. These inspections generally include EHS personnel participating as a member of the IACUC. EHS staff conducts laboratory safety visits annually to monitor workplace hazards and risks.

4) Describe institutional programs or methods used to track and evaluate safety-related workplace incidents, including injuries, exposures, accidents, etc. Include the frequency of such assessments. [*Guide*, pp. 18-19]

Exposure to hazards and work-related injuries are reported to the employee's supervisor and the individual is advised to seek medical attention. An incident report is submitted to the EHS office within 24 hours and the risk management office is contacted after the exposure to evaluate workman's compensation. The incident is reviewed by EHS and is followed-up with involved personnel to determine if changes to policies and SOPs are necessary to prevent additional exposures and/or injuries.

ii. Standard Working Conditions and Baseline Precautions

The following section pertains to the Occupational Health and Safety Program for all personnel associated with the animal care and use program. Specific information regarding the use of hazardous agents is included in ***subsection iii*** below.

1) Medical Evaluation and Preventive Medicine for Personnel [*Guide*, pp. 22-23] *Note:* Include blank forms used for individual health assessment as **Appendix 6.**

a) Describe who (e.g., personnel assigned to job/task categories in I.A.2.b.i.2) above) receives personal medical evaluation as a component of individual risk assessment. Describe who are ***not*** included and/or exempted from personal medical evaluation. *Note:* Do not include the names of personnel.

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All individuals that work with animals at TTU have the opportunity to receive a personal medical evaluation by the OccMed provider, but only individuals involved in PHS funded research are required to complete a personal medical evaluation. This is required to be completed annually, but an individual may receive this evaluation anytime even if they initially opt out of the program or if they feel their risks have changed. Animal Care Staff and Veterinary Staff also must participate in the personal medical evaluation. Physical plant staff are apprised of their risks through an annual video training. They are also offered the opportunity for a personal medical evaluation but are not required to participate. Non-employees, contractors, and undergraduate students involved in teaching protocols are not included in the personal medical evaluation.

b) Describe provisions for allowing an individual (following completion of individual health and job-related risk assessments) to decline participation in all or part(s) of subsequently available medical and preventive medicine components of the institutional program, e.g., vaccinations, physical examinations, respiratory protection, as applicable. Provide an estimate (percentage) of personnel associated with the animal care and use program that have declined participation in the medical evaluation program.
Note: Do not include names of the personnel

Individuals cannot decline tetanus diphtheria vaccination and boosters. They must participate in respirator fit testing if they wish to wear a respirator or N95 mask. At risk employees cannot decline rabies antibody testing/vaccination. Blood-borne pathogen testing is not required and is generally declined by individuals.

c) Describe provisions for assuring confidentiality of medical information.

TTU OHS WRAP assessment apprises animal users of their risks but does not collect any medical or personal information. Individuals participating in the personal medical evaluation complete and are instructed to transmit medical information directly to OccMed and Environmental Health and Safety (EH&S personnel are HIPAA certified). The IACUC Office receives a report for each individual from the OccMed physicians indicating they have been cleared to work.

d) Describe safety considerations for individuals with incidental exposure to animal care and use (e.g., contractors, personnel working in open laboratories).

Physical plant staff are apprised of their risks through an annual video training. They are also offered the opportunity for a personal medical evaluation but are not required to participate. Typically, physical plant employees are escorted into animal facilities with ACS staff. For individuals such as contractors, we provide hazard information that is dependent on the area in which work is being performed. Site appropriate PPE is required for all visitors regardless of their purpose in the facilities.

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e) Describe general features of the medical evaluation and preventive medicine programs, within the context of work duties, including:
- pre-employment/pre-assignment health evaluation,
- medical evaluations (including periodicity),
- diagnostic tests (e.g., for tuberculosis),
- precautions for working with potentially hazardous species (e.g., nonhuman primates, sheep, venomous species)
- immunization programs, and
- procedures for communicating health related issues.

TTU does not allow pre-employment medical evaluation. When individuals are identified that they will be working with animals, they are required to complete the generic animal care and use training and OHS Risk Assessment Survey. All individuals are offered a personal medical evaluation, but if they are working on a PHS funded project, they must complete the personal medical evaluation questionnaire and risk assessment (Appendix 6). OccMed personnel will determine and communicate with the individual as to what further assessments may be needed (ie. Vaccinations, respirator clearance, etc.). The risk assessment and medical questionnaires will be completed annually. Tetanus vaccinations are required and provided to all animal users. Rabies vaccinations are required for those working with high risk species (ie. Bats). Venomous species are only handled by the PI and his lab and SOPs are in place for accidental bites. Venomous species are in individual cages that are locked. The animal facility they are housed in is locked and restricted and the room they are housed in is locked and restricted.

No individuals are working with Tuberculosis. TTU does not have nonhuman primates.

Any workplace injuries or potential illnesses are communicated using the EHS incident reporting system.

f) Describe any other entities that provide medical services (e.g., emergency care, after-hours care, special medical evaluation, contracted services). Include a brief description of their credentials and/or qualifications, and how these entities remain knowledgeable about animal- or institution-related hazards and risks.

In the event there is an emergency situation the individual will receive treatment at the nearest medical unit. EH&S will review the incident report and make recommendations if needed.

2) Personnel Training Regarding Occupational Health and Safety
[*Guide*, p. 20]

Describe general educational program(s) to inform personnel about:
- allergies,
- zoonoses,

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- personal hygiene,
- physical injuries in animal facilities (e.g., noisy areas, large quantities of chemicals such as disinfectants, ergonomics) or species used (e.g., nonhuman primates, agricultural animals),
- other considerations regarding occupational health and safety.

Include in the description a summary of the topics covered, including:

- Entities responsible for providing the training
- Frequency of training or refresher training

Note: Do not include special or agent-specific training for personnel exposed to experiment-related hazardous agents; this will be provided in **Section iii.3** below.

Principal Investigators must be a faculty member, have a Ph.D., D.V.M., or equivalent degree, or be experts in a particular animal field (examples: rodeo coach, equestrian center manager), as well as have experience conducting animal research or using animals for teaching. Investigators are trained in the requirements for the ethical and humane use of animals in research and are competent in handling and manipulating their research animals. All investigators, undergraduate students, graduate students, IACUC members and technicians/staff that utilize live animals, regardless of prior experience, are required to complete "generic training" (http://www.depts.ttu.edu/iacuc/training/Generic_Training/Online_Generic_Training/index.htm) PowerPoint presentation and obtain a passing score of a 70 on the quiz. This presentation presents the current laws, regulations, guidelines and policies concerning the use of live animals and occupational health and safety at Texas Tech University. The procedure for completing and submitting an Animal Use Protocol is also discussed. Individuals may also receive information regarding species-specific zoonotic exposure. Individuals may choose to discuss work related exposures, including allergens, with our occupational healthcare provider and receive prophylactic vaccines according to their potential risks.

WRAP is designed to evaluate risks to animal users on a yearly basis. The web link is: 2018-2019_Non-TTU_OHS . WRAP assesses each individual animal user's risk specific to proposed animal use activities. Additionally, WRAP provides animal users with species-specific zoonoses, allergies, and physical hazard information. High-risk categories are noted, and if an individual falls into one of these categories then they are advised to meet with an occ-med physician. All individuals that work on a PHS funded project are required to complete a health history form on an annual basis, which is reviewed by an occ-med physician.

3) Personal Hygiene [*Guide*, p. 20; *Ag Guide* pp. 4-5]

a) List routine personal protective equipment and work clothing provided and/or required for animal care personnel, research and technical staff,

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farm employees, etc.

Workers are informed of University operating policies for respiratory protection, protection from hazards and noise protection. These programs can be reassessed by Environmental Health & Safety as needed in facilities that are proposed high risk.

ESB I & II, HSB, AFS, BSB- ACS personnel and animal users are provided scrub suits, lab coats, coveralls, rubber boots and other appropriate PPE depending on animal room requirements (ie. eye protection, booties, gloves). Depending on biosafety level, animal room PPE requirements are posted outside the door. ESB II has a dedicated ABSL-2 facility with a PPE anteroom and limited access with key card entry only. No shorts, skirts or open toed shoes are permitted in animal facilities.

TIEHH- Lab coats are provided and required for entry into the rodent facility. An anteroom is used to don lab coats and shoe covers and gloves are provided just inside the door. Lab coats are provided outside the laboratory in which the animal rooms are located.

Swine center- animal care staff and students working are provided complete on-site clothing (i.e. coveralls, socks, rubber boots and hearing protection). It is recommended to shower out of the facilities. Toiletries are provided. Clothing is laundered on-site. If an individual requesting entry to the swine center has been exposed to other pigs in the previous 72 hours, they will be required to shower into the facility. Biosecurity policy 01 must be followed.

Workers in field studies are advised and/or provided protective clothing commensurate with the risks to which they are exposed as determined by the PI and Safety Professionals.

Other farm staff and Texas Tech Equestrian Center and Tech Therapeutic Riding Center (TTEC, TTRC) staff and students wear appropriate personal work clothes.

Quail facilities- dust masks are provided when cages are changed.

b) Describe arrangements for laundering work clothing.

ESB I & II, HSB, AFS, BIOL- Scrubs, lab coats, towels and mop heads are laundered on site by ACS staff.

New Deal Dog Facility- Towels and mop heads are laundered on site by PI lab group.

Swine Center- coveralls, socks, towels are laundered on site by swine center staff.

TIEHH- lab coats and scrubs are laundered on site by animal care staff.

c) Describe provisions and expected practices for washing hands, showering, and changing clothes, including instances where work

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clothes may be worn outside the animal facility.

Hand sinks, showers and changing facilities are available to all employees at the farm and on campus (Biology, ESB I & II, HSB).

A hand sink is available at AFS, other farm facilities, TTEC, TTRC

All visitors of the swine center must wear boots and coveralls kept at the site and not wear street clothing; Showering in is required if the individual has been around pigs or other at-risk species before entering air spaces with pigs; Showering out is recommended at the Swine Center unless the visit is very brief (minutes; as in dropping off papers). For all other visitors, a Danish entry biosecurity procedure is utilized and hands are washed prior to entry onto the swine center and before leaving the premises.

Scrubs should be worn in the lab animal facilities (ESB I & II, HSB, BIOL) when handling animals. Coveralls or scrubs and rubber boots are provided and should be worn when handling animals or cleaning cages/pens.

d) Describe policies regarding eating, drinking, and smoking in animal facilities.

Eating, drinking and smoking are not permitted in animal rooms. Signage is posted at animal facilities.

4) Standard Personnel Protection [*Guide*, pp. 21-22]

a) Describe facility design features, equipment and procedures employed to reduce potential for physical injury inherent to animal facilities (e.g., noisy areas, large quantities of chemicals such as disinfectants, ergonomics) or species used (e.g., nonhuman primates, agricultural animals).

On campus facilities:

ESB I: Chemical detergents and disinfectants are stored on top of spill containment pallets. A dilution station is used for the disinfectant cleaner to ensure accurate diluting of the chemical used. SDS sheets are available for all chemicals used in the facility. Bio-Bubbles are used to minimize allergen exposure associated with animal dander and dust from dirty bedding. All ACS students and technicians are N95 respirator fit tested. N95 masks are used in the event of a Bio-Bubble malfunction or if a person develops an allergy associated with a specific species. The facility has Stonehard epoxy flooring throughout the facility to prevent slipping especially in areas like the cagewash room. Biosafety cabinets are available throughout the facility (in animal holding rooms and procedure rooms). These are used as primary containment devices when working with infectious agents or infected animals. They function as a barrier of protection for the technician (during change outs) and laboratory staff members (during

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experimental procedures). They aid in preventing exposure to biohazards while working with infection agents. They achieve this by preventing the escape of biological aerosols into the facility. The facility has anti-fatigue mats available for the technicians to work on. These reduce compression of the spinal-cord and improve posture and blood circulation. The cage wash area can become humid and warm. Fans are available to compensate for warmer temps and higher humidity in the wash room. At times, the wash rooms can be a loud environment to work in. To prevent noise induced hearing loss we have hearing protection available in the facility. Laboratory coats or scrubs are provided to be worn in the facility. Appropriate signage is hung outside the doors of each animal holding room describing the required PPE to be worn before entering the room. Personnel are trained in the proper operation and use of equipment and PPE. All PPE is properly disposed of before exiting the facility.

ESB II: Chemical detergents and disinfectants are stored on top of spill containment pallets. A dilution station is used for the disinfectant cleaner to ensure accurate diluting of the chemical used. SDS sheets are available for all chemicals used in the facility. A transfer station (or BSC) is located in each animal holding room for cage change outs and a bedding dump station is located in the dirty side cage wash to minimize allergen exposure associated with animal dander and dust from dirty bedding. All ACS students and technicians are N95 respirator fit tested. The facility has Nora® flooring throughout the facility to prevent slipping especially in areas like the cage wash room. Biosafety cabinets are available throughout the facility in procedure rooms and designated animal holding rooms. These are used as primary containment devices when working with infectious agents or infected animals. They function as a barrier of protection for the technician (during health checks) and laboratory staff members (during experimental procedures). They aid in preventing exposure to biohazards while working with infection agents. They achieve this by preventing the escape of biological aerosols into the facility. The facility has anti-fatigue mats available for the technicians to work on. These reduce compression of the spinal-cord and improve posture and blood circulation. The cage wash area can become humid and warm. Fans are available to compensate for warmer temps and higher humidity in the wash room. At times, the wash rooms can be a loud environment to work in. To prevent noise induced hearing loss we have hearing protection available in the facility. Laboratory coats or scrubs are provided to be worn in the facility. A PPE anteroom is provided before entering each section of the animal facility (barrier, conventional and ABSL-2). Signage is posted in each anteroom describing appropriate PPE donning. Personnel are trained in the proper operation and use of equipment, PPE and flow of the facility. All PPE is properly disposed of before exiting the facility.

BIO: Chemical detergents and disinfectants are stored on top of spill containment pallets. A dilution station is used for the disinfectant cleaner to ensure accurate diluting of the chemical used. SDS sheets are available for all chemicals used in the facility. Bio- Bubbles are used to minimize allergen exposure associated with animal dander and dust from dirty bedding. All ACS students and technicians are N95 respirator fit tested. N95 masks are used in the event of a Bio-Bubble malfunction or if a person develops an allergy associated with a specific species. The facility has anti-fatigue mats available for the technicians to work on. These reduce compression of the spinal-cord and improve posture and blood circulation. The cage wash area can become humid and warm. Fans are available to compensate for warmer temps and higher humidity in the wash room. At times, the wash rooms can be a loud environment to work in. To prevent noise induced hearing loss we have hearing protection available in the facility. Laboratory coats or scrubs are provided to be worn in the facility. Appropriate signage is hung

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outside the doors of each animal holding room describing the required PPE to be worn before entering the room. Personnel are trained in the proper operation and use of equipment and PPE. All PPE is properly disposed of before exiting the facility.

HSB: A dilution station is used for the disinfectant cleaner to ensure accurate diluting of the chemical used. SDS sheets are available for all chemicals used in the facility. Changing stations are used to minimize allergen exposure associated with animal dander and dust from dirty bedding. All ACS students and technicians are N95 respirator fit tested. N95 masks are used in the event of a changing station malfunction or if a person develops an allergy associated with a specific species. The facility has anti-fatigue mats available for the technicians to work on. These reduce compression of the spinal-cord and improve posture and blood circulation. The cage wash area can become humid and warm. Fans are available to compensate for warmer temps and higher humidity in the wash room. At times, the wash rooms can be a loud environment to work in. To prevent noise induced hearing loss we have hearing protection available in the facility. Laboratory coats or scrubs are provided to be worn in the facility. Appropriate signage is hung outside the doors of each animal holding room describing the required PPE to be worn before entering the room. Personnel are trained in the proper operation and use of equipment and PPE. All PPE is properly disposed of before exiting the facility.

AFS: A dilution station is used for the disinfectant cleaner to ensure accurate diluting of the chemical used. SDS sheets are available for all chemicals used in the facility. All ACS students and technicians are N95 respirator fit tested. N95 masks are used in the event of a Bio-Bubble/changing station malfunction or if a person develops an allergy associated with a specific species. The facility has anti-fatigue mats available for the technicians to work on. These reduce compression of the spinal-cord and improve posture and blood circulation. Laboratory coats or scrubs and rubber boots are provided to be worn in the facility. Appropriate signage is hung outside the doors of each animal holding room describing the required PPE to be worn before entering the room. Personnel are trained in the proper operation and use of equipment and PPE. All PPE is properly disposed of before exiting the facility.

Texas Coop Fisheries (Bats): Gloves, boots, and Tyvek suits are provided to be worn in the animal holding facility and are donned outside of the room.

Off Campus Facilities

Swine Center: Hearing protection and dust masks are provided to all employees or students working with swine. All Swine center personnel/visitors are required to put on farm-provided clothes and boots and are requested to shower in and out of the facility depending on biosecurity risk.

Beef Center and Burnett Center: Pen and Chute systems are used to move and restrain cattle for exams or procedures. Hearing protection and dusk masks are provided for all individuals working in the feed mill.

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TTEC/TTRC: Stocks are used to restrain horses and prevent injury to those working with horses.

New Deal Dog Facility: A dilution station is used for the disinfectant cleaner to ensure accurate diluting of the chemical used. There are Polypropylene barriers between kennels to keep dogs separate. Laboratory Coats, gloves and hearing protection are provided and can be worn at the lab member's discretion.

Erskine Quail Facility: Gloves and dusk masks are available for handling animals and cage changes.

Quail (TIEHH): Gloves and dusk masks are available for handling animals and cage changes.

TIEHH Rodent Facility (550): Lab coats are donned in an anteroom. At the entrance of the animal room, shoe covers, masks and gloves are provided. All animals are housed in IVCs. A BSC is provided in the animal room for cage change and animal procedures.

b) Describe likely sources of allergens and facility design features, equipment, and procedures employed to reduce the potential for developing Laboratory Animal Allergies (LAA).

Bedding is a major source of allergens from rodent excreta. All rodents are housed in individually ventilated, HEPA-filtered caging. ACS staff wear PPE during cage change out and dump bedding into a HEPA-filtered bio-bubble or HEPA filtered changing station. If ACS personnel ever need to dump bedding somewhere other than a HEPA-filtered container, they are all respiratory fit tested and will wear eye protection and N-95 masks.
Other likely allergen sources are dog, rabbit and cat dander. Employees hired at TTU undergo a risk assessment and OHS survey and are apprised of the potential species-specific allergen risks.

c) Describe likely sources of zoonoses and facility design features, equipment, and procedures employed to reduce potential exposure to zoonoses.

ESB II BSL2- Animals exposed to BSL2 agents are housed in ABSL2 rooms in individually ventilated caging. Cages are changed and animals are handled or manipulated only within a biosafety cabinet. Bedding is autoclaved. ACS staff and researchers wear agent appropriate PPE (signage posted in ABSL2 anteroom). TTU has limited ABSL2 activities and no ABSL3.

Animal users working in ABSL2 areas are trained in appropriate procedures for movement in and out of these areas. Hand washing sinks are available throughout the facility as well as showers if needed.

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d) Describe the procedures for the maintenance of protective equipment and how its function is periodically assessed.

Most personal protective equipment is disposable and replaced as needed. Lab coats, scrubs and coveralls are laundered on-site and not removed from the facility. Rubber boots are disinfected after each use and not removed from the facility. Biosafety cabinets, anesthesia machines and the waste dumping station are certified annually. Fire extinguishers are inspected annually. Safety showers are inspected monthly by ACS or designated lab personnel, and annually by EHS. Eyewash stations are inspected weekly by ACS or designated lab personnel. All other safety equipment is inspected monthly by ACS or EH&S personnel.

e) Respiratory Protection

i) Describe situations where respiratory protective equipment is available or required, such as cage washing facilities, feedmills, etc.

ESB I & II, HSB, BIOL- surgical masks are available at all times for all animal users and N95 masks are always available for ACS staff if needed for dumping bedding. A biobubble or transfer station is generally used for dumping bedding but ACS staff are respirator fit testing in the case of equipment failure or animal allergies.

Swine Center and Burnett Center- dust masks are available.

Quail facilities- dust masks are available for cage change.

All animal users are eligible for respirator fit testing. Environmental Health and Safety offers respiratory fit testing and training for those individuals that require or choose to wear respiratory protective equipment.

ii) Describe programs of medical clearance, fit-testing, and training in the proper use and maintenance of respirators.

The use of respiratory protection at Texas Tech University (TTU) is governed by the OSHA Respiratory Protection standard 29 CFR 1910.134. At TTU any employee or student that must receive an occupational exposure controlled through respiratory protection using a negative pressure respirator (including disposable respirators) is required to participate in our respirator program. The program consists of online educational training covering the standard and program as well as maintenance and limitations of these respirators. After completion of the online training, they must enroll in our occupational health program (OHP) and schedule an annual pulmonary function test through our OHP medical provider. Once receiving written clearance from the OHP provider the employee or student is required to be quantitative fit tested through TTU Environmental Health & Safety (EHS).

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iii) Describe how such respiratory protective equipment is selected and its function periodically assessed.

During the initial fit testing the user is fitted with the appropriate size and model of respirator for the anticipated exposure by EHS. The fit test is performed annually and during each session any reusable respirators are inspected and recertified by EHS personnel.

f) Heavy Equipment and Motorized Vehicles

i) Provide a general list of the types of cage-processing equipment used, such as rack/cage washers, tunnel washers, robotics, and bulk autoclaves. Describe training programs, informational signage, and other program policies designed to ensure personnel safety when working with such equipment.
Note: Details of specific equipment installed in animal facility(ies) are to be provided in **Appendix 15** (Facilities and Equipment for Sanitizing Materials).

Rack Washer (ESB II)
A Rack Washer specific SOP is in place to provide a detailed procedure of how to properly use this equipment. New staff members are trained in the operation of this equipment and observed for competency by a senior technician before they are able to operate it independently. Safety signage for operation and safety features are posted both externally and internally.

Cabinet Washers
Every cabinet washer in each facility operates differently. Cabinet Washer specific SOPs are in place to provide a detailed procedure of how to properly use this equipment. New staff members are also trained in the operation of this equipment and observed for competency by a senior technician before they are able to operate it independently. Signage is located above the emergency stop button of each cabinet washer identifying the emergency stop button.

Autoclave
An SOP is in place to provide a detailed procedure of how to properly use this equipment. New staff members are also trained in the operation of this equipment and observed for competency by a senior technician before they are able to operate it independently.

Operational standards require that the autoclave reach a temperature of no less than 121°C (250°F) for 30 minutes at 15 pounds per square inch pressure to effectively sterilize the load contents. Due to the high temperatures associated with the machine, heat resistant autoclave gloves protecting the hands and forearms are worn when removing items from the autoclave.

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Materials that may be considered biohazardous, including contaminated equipment and lab ware, must be rendered non- infectious prior to washing, storage, or disposal. To ensure health and safety, it is a matter of Texas law that all biohazardous materials, items potentially contaminated with such materials, items that could be mistaken for medical or biohazardous waste or items that have come in contact with biological materials must be decontaminated prior to disposal.

A variety of factors can affect the efficiency of an autoclave; therefore, regular testing of autoclaves to ensure sterilization conditions for temperature, time, and pressure are reached is crucial to insure sterilization and regulatory compliance.

Animal Care Services Staff, in conjunction with Environmental Health and Safety, perform weekly biological testing to ensure that all equipment is working properly in accordance with the Environmental Health and Safety Standard Operating Procedure for Periodic Autoclave Testing and Reporting. There is an EHS autoclave log binder located within the facility. This binders contains all pertinent validation information including: the date of testing, who completed the testing, who incubated the vials, whether autoclave passed or failed and the initials of the person logging the information.

ii) List other heavy equipment such as scrapers, tractors, and farm machinery (manufacturer name, model numbers, etc. are not necessary). Describe training programs, informational signage, and other program policies designed to ensure personnel safety when working with such equipment.
Note: If preferred, this information may be provided in a Table or additional Appendix.

1. Tractors
2. Feed truck
3. Fork lift
4. Skid steer
5. Livestock trailers
6. Mules
7. Farm trucks

Farm equipment training is provided by experienced farm staff. Please refer to TTU Ops 60.19, 60.21, 60.26, and 60.27.

iii) If motorized vehicles are used for animal transport, describe how the driver is protected from exposure to hazards such as allergens or zoonoses and decontamination methods employed. Also describe instances where vehicles may be shared between animal

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and passenger transport.

Farm animals are transported in covered open-air livestock trailers. When a trailer is used to transport swine, individuals are instructed to follow SOP058 Swine Trailer Bio-Security Procedures when cleaning the trailer.

Laboratory animals are transported in University-owned vehicles that are climate controlled and equipped with heaters and air conditioners (SOP030). Dogs, cats and rabbits are transported in standard cargo crates. Rodents are transported in cages with filter tops (IVC). Drivers are considered animal users and as such, are required to be trained in the appropriate care and use of animals. Training includes information pertaining to occupational health and safety including potential exposures to allergens and zoonoses. It is preferable that ACS transports animals in University vehicles, but if approved by the IACUC, a personal or other university vehicle may be used if the following conditions are met: adequate heating/cooling is available to maintain general animal comfort, protection from direct sun, protection from the general public, method to contain waste (e.g. plastic sheet under the cage, container around animal cage, etc.), method for allergen prevention/containment, method to secure the cage inside the vehicle and prohibited smoking, eating or drinking when animals are in the vehicle.

Wild-caught quail are transported in specialized containers in the back of University trucks.

g) Describe safety procedures for using medical gases and volatile anesthetics, including how waste anesthetic gases are scavenged.

The only volatile anesthetic that is used at Texas Tech University is Isoflurane. Isoflurane is used in rodent anesthesia machines, a large animal anesthesia machine and in closed containers. All of the anesthesia machines are precision vaporizers and an activated charcoal canister for scavenging excess anesthetic gas. The large animal anesthesia machine also contains a soda lime canister for scavenging excess carbon dioxide. Charcoal canisters are discarded after a 50 g increase in weight. If isoflurane is used for field studies (bell jar technique), it must be done in an open area to prevent excess gas accumulation and risk to personnel. The bell jar technique in laboratories is only used for terminal studies and must be performed within a hard ducted BSC or chemical fume hood. CO^2 and O^2 Gas tanks must be properly stored and secured. Anesthesia machines are certified annually.

iii. Animal Experimentation Involving Hazards [*Guide*, pp. 20-21]

1) List, according to each of the categories noted below, hazardous or potentially hazardous agents currently approved to be used in animals that are or will be maintained for more than a few hours following exposure. If the hazardous agent cannot be listed by name for security/proprietary reasons, identify it by the general category of agent and level of hazard. *Note:* If preferred, this information may be provided in a Table or additional Appendix.

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a) Biological agents, *noting hazard level* (CDC Biohazard Level, Directive 93/88 EEC, CDC or USDA/DHHS Select Agent, etc.). Examples may include bacteria, viruses, viral vectors, parasites, human-origin tissues, etc.

ABSL1 Agents
Bacteria- None
Viruses- None
Fungal- *Pseudogymnoascus destructans* (White Nose Syndrome)
Parasites- *Oxyspirura petrowii* (avian eyeworms)
Viral agents- Adeno-Associated Virus, HIV envelope protein

ABSL2 Agents
Bacteria- *Listeria monocytogenes*
Viruses- Influenza A/PR8/34 (H1N1), A/Hong Kong/8/68 (H3N2), A/Victoria/3/75 (H3N2) and A/New Jersey/8/76 (H1N1)
Parasites- Leishmania
Viral agents- M2e (surface peptide from influenza virus)
Human-origin tissues- A20 Tumor cells, OSC-19 oral squamous tumor cell line HK-2 cell line (human kidney cells), Caki-1 cell line (Renal cancer cells)

ABSL3- None

b) Chemical agents, *noting general category* of hazard (toxicant, toxin, irritant, carcinogen, etc.). Examples may include streptozotocin, BrdU, anti-neoplastic drugs, formalin, etc.

Toxins: Cholera, Pertussis, Streptolysin O, Lipopolysaccharide, Streptozotocin, Doxyrubicin

Irritants: Formalin, tricaine methanesulfonate (MS-222), Metformin, Ractopamine, Thiamethoxam, 6-Chloropyridine-3-carboxylic acid, Desnitro-imidacloprid hydrochloride

Carcinogens/Mutagens: Formalin, Streptozotocin (STZ), Gancyclovir, Tebuconazole

Other Chemicals/Compounds: Complete Freund's Adjuvant
Gold-nanoparticles, Perfluorooctantesulfonate, Perfluorobutanesulfonic acid, Perfluorohexanesulfonic acid, Perfluoroheptanoic acid, Perfluorononanoic acid, Perflourooctanesulfonic acid, Alum, Bifenthrin, Cyhalothrin, 1,4 dioxane, Anthracene, Hexachlorodecane, Chlorpyrifos, Parathion, Malathion, Dichlorvos, Diazinon, Esfenvalerate, Fenvalerate, Deltamethrin, Propiconazole, Pyraclostrobin, Azoxystrobin, 2-phenethylamine, Clothianidin, Imidicloprid

c) Physical agents (radiation, UV light, magnetic fields, lasers, noise, etc.).

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Echo-MRI (HSB Room 011), Biological Irradiator (HSB, Room 012F), Echo-MRI (BSB Room 408, Room 501), fMRI (ESB, Room 018), IVIS Imaging System (ESB, Room 08M), iDXA Scanner (New Deal Farm, Metabolism, Room 107)
Radioisotopes ^{3}H, ^{14}C, ^{125}I (HSB, Room 401E)

2) Experiment-Related Hazard Use [*Guide*, pp. 18-19; See also Chapters 2 and 3 in *Occupational Health and Safety in the Care and Use of Research Animals*, NRC 1997].
Note: Written policies and standard operating procedures (SOPs) governing experimentation with hazardous biological, chemical, and physical agents should be available during the site visit.

a) Describe the process used to identify and evaluate experimental hazards. Describe or identify the institutional entity(ies) responsible for ensuring appropriate safety review prior to study initiation.

Risks associated with proposed animal use activities (including experimental hazards) are identified and mitigated during protocol formulation and the review process. The TTU Animal Use Form (see Appendix 2) queries animal users for potential hazards including radiation, biological hazards (pathogens), toxic chemicals, and controlled substances. Once identified, animal users are directed to the appropriate safety committees for approval of proposed use of hazards and training. Animal Use Protocols will not be approved by the IACUC prior to approval from appropriate safety committees (e.g. IBC, ILSC, RSC).

b) Describe how risks of these hazards are assessed and how procedures are developed to manage the risks. Identify the institutional entity(ies) responsible for reviewing and implementing appropriate safety or containment procedures.

For animal protocols involving work with infectious agents, human body fluids or tissues, or recombinant DNA at TTU, the PI must submit a protocol to the Institutional Biosafety Committee (IBC) for review and approval. Animal protocols will not be approved by the IACUC prior to approval from IBC.

For animal protocols involving ionizing radiation or radioisotopes, the Radiation Laser Safety Committee (RLSC) reviews and approves proposed work only after radiation safety training and addition to appropriate sublicenses.

c) Describe the handling, storage, method and frequency of disposal, and final disposal location for hazardous wastes, including infectious, toxic, radioactive carcasses, bedding, cages, medical sharps, and glass.

Bedding from projects involving biohazardous material is placed in autoclave bags and autoclaved. Other biohazards or toxic waste is placed in a -80°C freezer or designated

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container and the TTU Environmental Health and Safety Office disposes the material in compliance with established guidelines for biohazards. Sharps are disposed into sharps containers, and they do not exceed being more than two-thirds full in the sharps container. Glass is disposed into glass disposal boxes or sharps containers.
Radioactive isotopes are used in one protocol (18038-04) and are stored and handled in a radiation safety approved lab. Mice are transported from the animal facility to the radioactive lab and are injected with radioisotopes. They are euthanized within a short period of time and do not return to the animal facility. After sacrificing the animals, the carcass is wrapped in absorbent paper and double bagged. All bedding and food is double bagged separately and bags are sealed with yellow tape and labeled (Isotope, total microcuries, date of administration, total gram weight). The animal carcasses, bedding, and food is stored in a freezer until Radiation Safety Personnel receive it for disposal. Contaminated cages, feeders, and water bottles must be washed separately from normal cleaning. All cages, feeders, racks, and water bottles must be demonstrated to be free of contamination, by the researcher, to the Radiation Safety Officer (RSO).

d) Describe aspects of the medical evaluation and preventive health program specifically for personnel potentially exposed to hazardous agents.

When hazardous agents are proposed in an AUP, IBC approval must first be obtained before the protocol will be approved. Consultation with IBC personnel is requested to discuss potential risk. Additional consultation can be obtained from the Occ-Med provider if needed. Furthermore, there is a University Chemical Hygiene Plan available.

3) Hazardous Agent Training for Personnel [*Guide*, p. 20]
Describe special qualifications and training of staff involved with the use of hazardous agents in animals.

Relatively few hazardous agents are used with animals at TTU. Animal use that involves a biohazard is reviewed and approved by the Institutional Biosafety Committee prior to the IACUC approval of the protocol. TTU EH&S provides laboratory safety training pertaining to chemical hazards. Animal users requiring use of radioactive materials must apply for, and receive a radioactive materials sublicense before purchasing will place orders for radioactive materials.

Additionally:

Training of the research staff in the use of hazardous agents is the responsibility of the PI involved with that specific research.

The Texas Hazard Communication Act requires a written Hazards Communication Policy. University OP 60.02 is the written policy.

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4) Facilities, Equipment and Monitoring [*Guide*, pp. 19-20]

a) Describe locations, rooms, or facilities used to house animals exposed to hazardous agents. Identify each facility according to the hazard(s) and containment levels (if appropriate*).*
Note: If preferred, information may be provided in a Table or additional Appendix.

ESB II - ABSL2 Suite- Leishmania, Influenza, Listeria
BSB 617CC- Toxins (Pertussis, Streptolysin O, Lipopolysaccharide)
BSB 409-STZ
HSB 401E- Radioisotopes ^{3}H, ^{14}C, ^{125}I (no housing; <8 hours)
HSB 12B- STZ

ABSL2 rooms are under negative pressure, appropriate PPE is provided and signage is posted in the PPE anteroom prior to entry into the ABSL2. All rodents are housed in HEPA-filtered individually ventilated caging and manipulated within a BSC.

b) Describe circumstances and conditions where animals are housed in rooms outside of dedicated containment facilities (i.e., in standard animal holding rooms). Include practices and procedures used to ensure hazard containment.

Animals exposed to hazardous material are housed at the appropriate biosafety level.

c) Describe special equipment related to hazard containment; include methods, frequency, and entity(ies) responsible for assessing proper function of such equipment.

Class II A2 BSC are located within the ABSL2 procedure rooms. All BSL2 animal work is conducted in the BSC and animals are housed in HEPA-filtered individually ventilated caging. All BSCs are certified annually. ABSL2 animal rooms are under negative pressure and air pressure differentials are tested by ACS staff weekly (ESB) or monthly (HSB, BIOL, AFS) using a smoke machine. Pressures are visually monitored at the room level daily by ACS staff in ESB II.

Cages are clearly labeled when a hazardous chemical agent is administered to a research animal to alert ACS staff to alternate husbandry requirements and animal adverse effects.

d) Describe the husbandry practices in place to ensure personnel safety, including any additional personnel protective equipment used when work assignment involves hazardous agents.

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Any individual entering an ABSL2 room must don the appropriate PPE. PPE requirements are posted in the PPE anteroom. Any animal handling or manipulations must occur within the BSC in the procedure room. Cage change outs occur within a transfer station located in the animal room. Infected ferrets are housed in ventilated containment cages with HEPA filters and transferred to a BSC for manipulations.

e) Incidental Animal Contact and Patient Areas

i) List and describe facilities that may be used for both animal- and human-based research or patient areas, including the policies and procedures for human patient protection, facility decontamination, animal transport through common corridors or elevators, and other personnel protection procedures.

The Texas Tech Neuroimaging Institute in the Experimental Sciences Building is a dual use functional MRI facility SOP (SOP 053). It is designed and arranged such that animals have a separate entranceway and service elevator into the scanner area to eliminate any contact with human participants. When in the scanner proper, sedated animals may be wrapped in a plastic bag and rest on a custom-made plexiglass mount, which segregates them from contact with the scanner table. The head coil may be exposed and that too has a plastic wrapped support pillow inside that is either removed or cleaned thoroughly before/after use, thus posing no risk to human participants. Following all scans, all equipment (scanner table, power contrast injectors, all leads, all coils and any spills and drips) that directly or indirectly touches the animal is thoroughly cleaned with 10% bleach solution or disinfecting towelettes, and all trash and linens are removed. We have not run any human participants in the scanner during the same days/week as animal studies (our policy will limit animal studies to be conducted only on special days of the month so as not to overlap with human studies). The policies and procedures are typical for dual-use MRI equipment at Neuroimaging centers across the country. There is currently 1 approved protocol (18069-08) using the fMRI for dogs, although no scans have been performed.

ii) Describe any *other* circumstances in which animals or caging equipment are transported in common use corridors or elevators (e.g., have the potential to come in contact with individuals not associated with the animal care and use program), and measures taken to mitigate risks associated with such use.

Occasionally, a cage wash becomes non-functional and dirty caging will have to be transported to a functional cage wash for cleaning. Soiled cages are placed in plastic bags prior to transport. Freight elevators are used when possible, but occasionally common use elevators must be used (i.e. HSB).

During animal transport (SOP030), animals are transported in their home cage and cages are covered with a cloth to minimize allergen and public exposure. Animal shipping crates are sprayed with a disinfectant prior to entering facilities.

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B. Program Oversight

1. The Role of the IACUC/OB [*Guide*, pp. 24-40]

a. IACUC/OB Composition and Function [*Guide*, pp. 17; 24-25]

Please provide a Committee roster, indicating names, degrees, membership role, and affiliation (e.g., Department/Division) as **Appendix 7**.

i. Describe Committee membership appointment procedures.

The CEO is the President of Texas Tech University, Lawrence Schovanec, PhD, and he affirms the appointment of the IACUC by the IO. President Schovanec has appointed Dr. Joseph Heppert as the Institutional Official. Dr. Heppert reports to the President as IO and is also the Vice President for Research & Innovation. IACUC members are appointed in writing by the IO annually.

ii. Describe frequency of Committee meetings. Note that **Appendix 8** should contain the last two IACUC/OB meeting minutes.

The IACUC meets face-to-face monthly to conduct regular business, or more often if needed. The IACUC conducts self-training and members attend regional and national meetings for continuing education purposes.

iii. Describe the orientation, training, and continuing education opportunities for IACUC/OB members. [*Guide*, p. 17]

Each new IACUC member receives initial orientation and training directly from the IACUC chair. At this orientation meeting they receive a ~2-hour introduction to the Federal animal laws and policies, an overview of the TTU program and review processes, specific guidance about their role as an IACUC member, and their responsibilities in the review and designated review process. TTU pays particular attention to the following: 1) how the TTU form meets the requirements of the PHS and AWA; 2) requirements for the 200-word non-technical summary of the project; 3) what constitutes adequate rationale and justification for the proposed species, use, and number of animals to be used; 4) that the required literature search provides evidence the principles of the 3 R's are considered; 5) effective evaluation of the descriptions of all procedures and treatments applied to animals; 6) USDA pain categories and TTU policy for full-committee review; 7) justifications required for conditionally or non-AVMA approved methods of euthanasia; 8) humane endpoints and criteria for monitoring and intervention; 9) potential complications have been considered; and 10) a harm/benefit analysis is done for all proposed research, teaching, or demonstration activities involving animals. Each new member is also provided access to electronic copies of the 8th edition of the Guide, USDA Animal Welfare Regulations & Policies, AVMA guidelines for euthanasia 2013, the

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TTU IACUC Policies, AAALAC information, and numerous other animal care and use reference and training resources.

All IACUC members are encouraged to attend IACUC 101, IACUC 201, SCAW, iCARE, and PRIM&R programs publicly offered, in which TTU subsidizes their travel. TTU sends approximately 6 members per year for additional training opportunities. New IACUC members are slowly integrated into the review process by allowing them to acquire experience before they are assigned to be a Designated Reviewer. They are encouraged to avail themselves to the appropriate CITI IACUC training modules. The Committee Chair, and any other IACUC member who chooses, brings issues, example protocols, and cases from workshops and other sources to the monthly IACUC meetings to discuss specific problems and important issues in animal welfare. TTU and TTUHSC organized and hosted IACUC 101 in October 2018. Many of TTU IACUC members participated in this educational opportunity. In February 2019, 6 IACUC members and the Post Approval Monitor attended iCARE, in Dallas, TX.

b. Protocol Review [*Guide*, pp. 25-27]
A blank copy of your institution's protocol review form should be provided as **Appendix 9**. Also include forms used for annual renewal, modifications, amendments, etc., as applicable.

i. Describe the process for reviewing and approving animal use. Include descriptions of how:
- the IACUC/OB weighs the potential adverse effects of the study against the potential benefits that may result from the use ("harm-benefit analysis"),
- protocols that have the potential to cause pain or distress to animals are reviewed and alternative methodologies reviewed,
- veterinary input is provided, and
- the use of animals and experimental group sizes are justified.

Note: Make sure you address each of the items above.

Animal care protocols are reviewed either by designated review (Designated Member Review) or at the monthly meetings (Full Committee Review) and, if approved, are valid for up to maximum of three years. Protocols must be reviewed annually to remain in effect. A complete re-submission, de novo protocol is required each three years.

Use of live vertebrate animals at Texas Tech requires an approved protocol, based on if animals will be housed at a TTU owned facility and if TTU personnel will be handling the animals. All protocols are assessed for completeness, potential pain and distress of animals, appropriate drug doses and choices, lack of duplication, and for potential alternatives to animal use. IACUC members are trained to evaluate the harm-benefit analysis which is emphasized during the review process and often discussed in IACUC meetings. AVMA approved methods of euthanasia must be used or otherwise justified. Animals must have access to veterinary

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care. Animal health and/or production records must be available for viewing. Animal users must be appropriately trained. The OHS program is based on a Hazard Analysis and Risk assessment for animals in each major class (laboratory, farm, or wildlife). Each animal user is offered participation in the OHS program; certain people working with known hazards (rare on this campus) would be required to participate in the OHS program. All individuals that work on PHS funded projects are required to complete a health history assessment on an annual basis, which is reviewed by trained Occ-Med staff.

The PI and the IACUC are responsible for oversight of animals in their charge. A centralized staff that reports to the AV/Director of Animal Care Services provides laboratory animal care of on-campus animals. At each IACUC meeting approximately 10 SOPs/LOPs/Policies are reviewed and approved by the IACUC. The SOPs/LOPs/Policies are brought back before the committee on a 3-year cycle in order to update the information.

Laboratory animals cannot be ordered without an approved animal care protocol number. The Post-Approval Monitor checks for IACUC approval and animal numbers prior to ordering. Breeding herds are on approved protocols. Animals used in research, teaching and demonstration that are owned by Texas Tech University or housed at TTU facilities must be on an approved protocol.

Agricultural animals, not involved in teaching or research, residing on Texas Tech property but, not owned by Texas Tech University (ex. Rodeo Team Horses, privately owned horses boarding at TTEC), are required to receive veterinary care if needed either through the University or another approved Veterinarian. All animals used in teaching or research must be on an approved protocol even if the institution does not own the animals.

The Texas Tech University IACUC uses a process of Designated Member Review (DMR) for all animal use protocols (AUP). Any member at any time during the review process can elect to call an AUP for Full Committee Review (FCR).

One of two processes is followed for each AUP. The AUP completed by a PI is received in the IACUC office by the IACUC coordinator. The IACUC coordinator and the IACUC chair review the protocol for completeness and assign a tentative USDA pain category. The AUP is distributed to all committee members electronically, and IACUC members are assigned (by the IACUC Chair) to be the DMR. The IACUC Chair may also elect to have Expert Reviewers to assess the AUP when appropriate. All committee members are asked to share comments and concerns about the protocol with the DMR, or any IACUC member can call for full, in-person IACUC review of that AUP within 3 business days. If a member does not call the AUP for Full Review, then the process #1 is followed:

1. Designated Member Review:
The Lead DMR is given 5 business days to complete their review. Expert reviewers, university veterinarian reviewers, and secondary reviewers receive 4 business days to assess the AUP.

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The DMRs will either (a) recommend approval of the protocol (b) recommend approval of the protocol pending clarifications/modifications (modifications required to secure approval), or (c) request full-committee review.

If “approved pending clarifications/modifications”, the Principal Investigator is informed of the required clarifications/modifications and has 30 days to return the revised AUP. All AUPs are reviewed by a university veterinarian and IACUC Chair.

All correspondence is routed through the IACUC Coordinator to maintain complete records.

If “request full-committee review”, is indicated by any IACUC member, the AUP will be reviewed at the next scheduled IACUC meeting under the guidelines for Full-Committee Review.

2. Full Committee Meeting Review:
a) These protocols should be received one week before the scheduled meeting.

b) The IACUC Chair assigns a Lead Reviewer to the protocol.

c) At the scheduled monthly meeting, the Lead Reviewer reports the findings before the Committee.

d) The committee will either: 1) approve the protocol, 2) approve pending clarifications/modifications (modifications required to secure approval), or 3) withhold approval.

e) If “approved”, the Animal Use Protocol is assigned an IACUC approval number and the Principal Investigator receives the approval letter.

f) If “approved pending clarifications/modifications”, the Principal Investigator is informed of the required clarifications/modifications and has 30 days to return the AUP with the clarifications/modifications. The IACUC chair will review the Animal Use Protocol for the required clarifications/modifications.
IACUC members also are given access to the revised protocol. The AUP is then reviewed again at the next practicable IACUC meeting.

g) In situations where relatively minor edits/changes are required, the IACUC may propose (and vote) to send the protocol through the DMR review process. A protocol may only be sent through the DMR review process upon a unanimous vote of the committee. Upon a unanimous vote, the IACUC Chair assigns a DMR and the protocol is treated as a designated review with one exception. All subsequent changes initiated by the DMR and PI are sent electronically to the full committee for review. At this time, any IACUC member may elect to call the protocol for full in-person committee review. If no additional comments are received by the DMR, they may recommend approval, an IACUC approval number is issued, and the Principal Investigator receives the approval letter. (TTU Policy 18). Committee members sign

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a form on an annual basis agreeing that protocols considered for Full Review may be sent through the DMR process upon a unanimous vote of members at an official IACUC meeting where quorum is obtained.

h) If "withhold approval", the Principal Investigator is informed of the IACUC decision and the reasons for withholding approval.

i) The discussions and review of the AUP are documented in the IACUC minutes and clarification memos.

ii. Describe the process for reviewing and approving amendments, modifications, and revised protocols. If applicable, include a description/definition of "major" vs. "minor" amendments.
Note: If preferred, this information may be provided in a Table or additional Appendix.

The Texas Tech University IACUC procedures for review of proposed significant changes in ongoing research projects are:
Amendments are used when a Principal Investigator needs to change a protocol because of a change in title, a change in personnel (adding, deleting), a change in funding source, a change in location, a change in the number of animals needed in the protocol, adding a species, and adding, deleting and/or changing a procedure. Amendments must be submitted to the IACUC Coordinator on the current IACUC Amendment Form. These are the following amendments:

1) Administrative Amendment: The IACUC Chair and/or a University Veterinarian may administratively approve the amendment that changes personnel, location, titles, request for additional animals if less than 10% from original protocol, and/or funding source. The Principal Investigator receives the approval and the amendment is attached to the original AUP.

2) Veterinary Verification and Consultation (VVC) (TTU Policy 018): Approval may be granted by a University Veterinarian under specific circumstances, which includes the following: anesthesia, analgesia, sedation, and euthanasia (any method approved by the AVMA Guidelines for the Euthanasia of Animals). Additionally, this amendment process will cover the duration, frequency, type, or number of procedures to be performed on an animal as long as those procedures are either approved in the protocol or are approved in TTU IACUC SOP's. The Principal Investigator receives the approval and the amendment is attached to the original AUP.

3) Regular Amendment: Involves a change in the number of animals greater than 10% increase from the original protocol, adding animal species, and (or) adding, deleting, and/or changing procedure. The review and approval procedure for this amendment is identical to the review and approval procedure for a regular AUP.

The review and approval of the AUP amendments are documented in the IACUC minutes.

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c. Special Considerations for IACUC/OB Review [*Guide*, pp. 5; 27-33]

i. Experimental and Humane Endpoints [*Guide*, pp. 27-28]

1) Describe the IACUC/OB's review of "humane endpoints," i.e., alternatives to experimental endpoints to prevent or in response to unrelieved animal pain and distress.

The IACUC requires PIs to search for, identify, explain, and justify animal study endpoints that are humane and scientifically defensible. When a protocol involves more than momentary pain or distress, a literature search is required to search for alternatives to procedures that result in pain or distress. The IACUC frequently requests references to painful or distressful procedures. If a protocol is a USDA Category D or E study, then consultation with a University veterinarian is required. The consultation may include anesthesia, analgesia, surgical procedures, pain/distress species-specific symptoms and humane endpoints. Category E protocols (unrelieved pain and distress) are heavily scrutinized by the IACUC and must include strong justification for approval.

2) For studies in which humane alternative endpoints are not available, describe the IACUC/OB's consideration of animal monitoring and other means used to minimize pain and distress (e.g., pilot studies, special monitoring, other alternatives).

PIs are required to include the following information as well as consult a university veterinarian on humane endpoints in protocols where no alternatives to pain or distress are feasible:

a) Identity and description of reliable and relevant endpoints including easily identifiable signs, symptoms, behaviors, etc.
b) Frequency with which monitoring for humane endpoints will occur throughout the study. Often the IACUC will require monitoring to be more frequent
c) Who will be responsible for monitoring the animals and what training they have received which enables them to readily identify the humane endpoints.
d) What will be done, and how quickly will actions be taken in the event that humane endpoints are reached.

When new, unproven techniques or procedures are proposed which inflict, or could possibly cause pain or distress in animals, the IACUC encourages pilot studies to minimize pain and distress in larger numbers of animals (in cases where pain and distress does indeed result from the technique or procedure). Protocols in which significant pain or distress is expected are supervised, or monitored closely by veterinary staff and post-approval monitor. Further, all protocols which contain descriptions of techniques or procedures which cause pain or distress are scrutinized by the IACUC for justification, clear

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identification of humane endpoints, observation and monitoring frequency, training of personnel charged with monitoring for signs and symptoms of pain or distress, and timely intervention strategies. Investigators are also prompted to consider alternative procedures for pain- or distress-inducing procedures to the extent possible through literatures searches, and consideration of other models (lower life forms, computer models/simulation, cell cultures, etc.). Anesthesia and analgesia should be used to minimize pain or distress whenever possible.

3) Identify personnel responsible for monitoring animals for potential pain and distress and describe any mechanisms in place to ensure that the personnel have received appropriate species- and study-specific training.

Personnel responsible for monitoring animals in protocols involving potential pain and distress include the PI, graduate students, laboratory staff, ACS staff and veterinary staff or a combination. During protocol review, animal experience is determined for each individual involved in the project. Non-experienced students or staff will be properly trained by the PI, ACS staff or veterinary staff before they can be responsible for monitoring animals for pain and distress. For on-campus facilities, ACS staff observes all animals daily. Procedures that result in pain or distress require more frequent observation. Protocol endpoints are adhered to closely and laminated copies of those endpoints are posted in the animal room. A card system is used for tumor burden and infectious disease studies. If animals have reached their humane endpoints, ACS will alert PIs immediately.

ii. Unexpected Outcomes that Affect Animal Well-being [*Guide*, pp. 28-29]
Describe how unexpected outcomes of experimental procedures (e.g., unexpected morbidity or mortality, unanticipated phenotypes in genetically-modified animals) are identified, interpreted, and reported to the IACUC/OB.

Animals are monitored by investigators, students and animal care staff. Any abnormalities are reported to the facilities manager and/or veterinarian. Unexpected outcomes or adverse events are defined as any event that negatively impacts animal well-being (TTU Policy 024). It can include an event not identified in the approved protocol, an outcome that occurs at a rate or severity higher than indicated in the approved protocol, or events that are not research-related, but due to a facility, physical plant, equipment or personnel failure, malfunction or mistake. TTU Policy 24 outlines procedures to following in the case of an unexpected outcome, including completing an Adverse Event Report form.

Transgenic animals or animals involved in infectious disease research are monitored more frequently (more than once throughout the day) by staff for morbidity, experimental endpoints or unexpected outcomes that affects animal well-being, including atypical phenotype.

iii. Physical Restraint [*Guide*, pp. 29-30]
Note: This section is to include only those protocols that require prolonged restraint. Brief restraint for the purpose of performing routine clinical or

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experimental procedures need not be described.

1) Briefly describe the policies for the use of physical restraint procedures or devices. Include, if applicable, the IACUC/OB definition of "prolonged."

Protocols involving prolonged restraint are extremely rare at TTU. However, projects requiring prolonged restraint of animals would need justification from the investigator and would be carefully evaluated by the IACUC before approval. See TTU Policy 26.

Prolonged restraint is defined as the use of a physical restraint of a non-sedated animal for 30 minutes or longer in a natural position, 10 minutes or longer in an unnatural position, or any duration for any position (natural or unnatural) in which a body part is fixed.

2) Describe animal restraint devices that are used or have been used within the last three years. For each device, briefly describe

- the duration of confinement
- acclimation procedures
- monitoring procedures
- criteria for removing animals that do not adapt or acclimate, and
- provision of veterinary care for animals with adverse clinical consequences.

Note: If preferred, this information may be provided in a Table or additional Appendix.

Pregnant sows are housed in both gestation crates and group pens. Gestation and farrowing crates are the current industry standard, but the University is investigating alternative housing systems for breeding swine.

18072-11 Mice are removed from their home cage and placed into a 50 ml conical tube with ventilation holes, head first. The mice remain in the tube for 60 minutes (chronic stress study) or 3 hours (acute stress study) under constant supervision. If the mice fail to adapt to the prolonged restraint, they will be removed from the restraint apparatus. Veterinary care will be provided if injury occurs from the restraint.

Alligators are captured and restrained with ropes and wrapped in a tarp for 60 minutes (19033-05) or usually 1-2 hours and no longer than 10 hours (18066-07). Restraint is used to keep the animal from harming itself and the researchers. Animals are observed throughout the entire duration of restraint.

19026-03 Sheep are housed in metabolism crates for a max of 7 days (2 days acclimation followed by 5 days diet and feces collection). Sheep maintain visual, olfactory and auditory

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contact with other sheep. Sheep are able to stand, lie, walk forward and backwards, but they cannot turn around. If sheep fail to adapt, they are removed from the crates.

iv. Multiple Survival Surgical Procedures [*Guide*, p. 30]
Note: One survival surgical procedure followed by a non-survival procedure is not included in this category.

1) Describe the IACUC/OB's expectations regarding multiple survival surgery (major or minor) on a single animal.

Multiple survival surgeries are rare at TTU and would need scientific justification from the investigator. These protocols would be carefully evaluated by the IACUC before approval. Consideration would include the impact on the animals, interval between surgeries, severity of pain and scientific justification.

2) Summarize the types of protocols currently approved that involve multiple major survival surgical procedures

Note: If preferred, this information may be provided in a Table or additional Appendix.

Protocol 17021-02 Rats and mice will undergo gastric bypass surgery and recovery at another institution before being transported to TTU. After arrival and quarantine period, rodents are implanted with mediobasal hypothalamus cannula and the 4-5 days later, arterial and jugular catheters.

Protocol 17062-08 Rats and mice will have mediobasal hypothalamus cannula implanted then 4-5 days later will have arterial and jugular catheters placed.

v. Food and Fluid Regulation [*Guide*, pp. 30-31]. *Note:* This does not include pre-surgical fast.

Summarize the types of protocols that require food and/or fluid regulation or restriction, including:

- justification
- species involved
- length and type of food/fluid regulation
- animal health monitoring procedures and frequency (e.g., body weight, blood urea nitrogen, urine/fecal output, food/fluid consumption)
- methods of ensuring adequate nutrition and hydration during the regulated period

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Note: If preferred, this information may be provided in a Table or additional Appendix.

Protocol	Species	Length/Type	Monitoring	Adequate nutrition/hydration
18072-11	Mice/Rats	8h daily X 21 d food/water	Body weight, physical appearance (hair coat, posture)	Daily body weight and health checks, hair coat appearance
17028-03	Xenopus	10d food	Physical appearance, activity level	Daily health checks-discoloration, responsiveness
18007-01	Swine	24h food prior to euthanasia	Physical appearance, activity, body weights	Daily health checks-hair coat appearance, sunken flank
16082-08	Mice	12h food	Physical appearance (hair coat, posture)	Daily health checks-hair coat appearance, activity level
18064-07	Mice	Food restriction-85% free feeding	Body weight; physical appearance (hair coat, posture)	Daily body weight and health checks
19034-04	Mice	Food restriction – 70% free feed body weight	Body weight; physical appearance (hair coat, posture)	Daily body weight and health checks
17003-01	Mice	24h food	Physical appearance (hair coat, posture, activity level)	Daily health checks-hair coat appearance (scruffy) and posture (hunched)
17062-08	Mice/Rats	24h food	Body weight, physical appearance (hair coat, posture)	Daily health checks-hair coat appearance (scruffy) and posture (hunched)

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18032-12	Bats	Hibernation period	Physical appearance (roosting and wing position), body mass	Daily video monitoring for signs of morbidity. Physical confirmatory observation (responsiveness, body mass, mobility, vocal)
18080-10	Cattle	14-16h food	Body weight, physical appearance	Daily health checks: sunken flanks. Rumen and GI tract hold 60L or more feed throughout at a ~5%/h passage rate
19029-03	Fathead minnows	24h food	Physical appearance	Daily health checks

Justification

Protocol 18064-07 involves food restriction (85% of free-feeding weight). This is standard procedure for studies of operant conditioning and has been used for many years without adverse health effects.

Protocol 19034-04 involves food restriction (70% of free-feeding body weight) to demonstrate the effects of calorie restriction on improving insulin sensitivity and longevity.

Protocol 17028-03 involves fasting for 10 days to determine predator response. Animals are observed daily and any abnormalities are recorded and reported.

Protocol 18007-01 involves fasting overnight up to 24 h prior to euthanasia to remove digestive contents from the stomach and intestines for endoscopy and tissue collection.

Protocol 18072-11 offers food and water for only 8 hours a day for during a three week period of a stress paradigm. The purpose is to examine the effect of environmental stress on brain function. Mice will be exposed to restricted food and water daily for 3 weeks, and their physical appearance will be monitored (for example: posture, hair loss), and weight loss will be measured throughout (and also before and after). Significant weight loss (>20% of initial body weight) will be considered as criteria to remove the animal from the study.

Protocol 17062-08 uses 24 h fasting design to study the brain control of energy balance and/or nutrient metabolism. This fasting period establishes a good baseline (no change in circulating nutrient metabolites, no food in the gut, no change in levels of nutrient-related hormones) as well as inducing a motivated voluntary feeding during the re-feeding period.

Nutritional Sciences (17003-01, 16082-08) routinely conducts a 4-12 hour fast to measure Glucose and Insulin Tolerance testing (GTT and ITT).

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Protocol 18032-12 is a hibernation study in bats, therefore food is not provided because bats in torpor do not eat, however, water is provided. Disturbing bats throughout hibernation may cause them to arouse too frequently and burn through fat stores prematurely, which would be detrimental to their health and wellbeing. Through video monitoring, bats are checked daily for signs of morbidity (roosting near the cage floor with wings extended for >24 hours). Bats of concern are then physically assessed for body mass and responsiveness to determine if the bat should be removed from the study.

Protocol 18080-10 uses 14 – 16 h restricted feed intake prior to weighing for shrunk body weights. Shrunk body weights are necessary to determine a more accurate and comparable body weight of the cattle which is subject to "gut fill" from the rumen holding 60L or more (approximately 120lb) feed at any time. When feed is in a transient state throughout the gastrointestinal tract, body weight measurements are subject to error.

Protocol 19029-03 fasts for 24 hours prior to treatment to ensure that the fish will feed on the *Daphnia magna* which is the route of experimental exposure.

vi. Use of Non-Pharmaceutical-Grade Drugs and Other Substances [*Guide*, p. 31]

Describe the IACUC/OB's expectations regarding the justification for using non-pharmaceutical-grade drugs or other substances, if applicable.

The Texas Tech University IACUC's position on the use of non-pharmaceutical grade compounds / substances in animal studies is directly aligned and in accordance with the policy supported by the USDA and OLAW. Thus, in animal studies conducted at Texas Tech University, the use of non-pharmaceutical grade substances / compounds / drugs must be based on:

1. Scientific necessity, OR
2. Non-availability of an acceptable veterinary or human pharmaceutical-grade compound, AND
3. Specific review and approval by the Texas Tech University IACUC.

Specifics of the use of non-pharmaceutical compounds in research animals must be described within animal protocols, providing justification that is either based on scientific necessity or non-availability. In certain situations the Texas Tech University IACUC may review and approve the use of non-pharmaceutical grade substances. Some examples of these scenarios are listed below (TTU Policy 14).

1. No equivalent veterinary or human pharmaceutical is available for experimental use. Under these circumstances the highest-grade equivalent chemical reagent should be used. If the substance must be formulated, this should be done aseptically and with a non-toxic vehicle as appropriate for the route of administration.

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2. Non-pharmaceutical grade substances are required to replicate methods from previous studies because results will then be directly comparable to those of replicated studies. This scenario may be considered even though an equivalent veterinary or human drug is readily available for experimental use.

3. Although an equivalent veterinary or human pharmaceutical is available, dilution or change in formulation is required.

4. The available veterinary or human pharmaceutical is not concentrated enough to meet experimental requirements.

5. The available veterinary or human pharmaceutical does not meet the non-toxic vehicle requirements for the specified route of injection.

Under any of these scenarios using non-pharmaceutical grade substances, consideration should be given to the alternative grade, purity, sterility, pH, pyrogenicity, osmolality, stability, site and route of administration, formulation, compatibility, and pharmacokinetics of the chemical or substance to be administered. Any of these characteristics of the non-pharmaceutical grade substance or reformulated substance may be requested by the IACUC during the protocol review process.

vii. Field Investigations [*Guide*, p. 32]

Describe any additional considerations used by the IACUC/OB when reviewing field investigations of animals (non-domesticated vertebrate species), if applicable.

The Committee assures that necessary State and Federal permits are obtained. Following Sikes et al. (2012) we refer to appropriate guides from the professional societies (listed below). We rely on committee expertise, other professionally accepted references (see below) or outside expertise when issues outside the coverage of the guides requires it.

Professional Society Guides

Beaupre SJ, Jacobson ER, Lillywhite HB, Zamudio K. 2004. Guidelines for the Use of Live Amphibians and Reptiles in Field and Laboratory Research. American Society of Ichthyologists and Herpetologists. (28 June 2012; www.asih.org/files/hacc-final.pdf)

Fair JM, Paul E, Jones J, eds. 2010. Guidelines to the Use of Wild Birds in Research, 3rd ed. Ornithological Council. (28 June 2012; www.nmnh.si.edu/BIRDNET/guide/index.html)

Sikes RS, Gannon WL, Animal Care and Use Committee of the American Society of Mammalogists. 2011. Guidelines of the American Society of Mammalogists for the use of wild mammals in research. Journal of Mammalogy 92: 235–253.

Professionally Accepted

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Murphy, B. R. and D. W. Willis. Eds. 1996. Fisheries Techniques. Second Edition. American Fisheries Society. Bethesda, Md.

Silvy, N. Ed. 2012. The Wildlife Techniques Manual: research. volume 1. Johns Hopkins University Press.

Additional Sources

National Research Council 1974. Amphibians: Guidelines for the Breeding, Care and Management of Laboratory Animals. Washington, DC: The National Academies Press. https://doi.org./10.17226/661.

Pool, V.A. and S. Grow (eds.). 2012. Amphibian Husbandry Resource Guide, Edition 2.0. Association of Zoos & Aquariums, Silver Spring, MD. pp. 238.

Bird, D. M., and K. L. Bildstein. 2007. Raptor research and management techniques. Hancock House Publishers, Blaine, WA.

Boal, C. W., M. C. Wallace, and B. Strobel. 2010. Perspectives on Animal Welfare Legislation and Study Considerations for Field-Oriented Studies of Raptors in the United States. Journal of Raptor Research 44(4):268-276.

Ralph, C. J., G. R. Geupel, P. Pyle, T. E. Martin, and D. F. DeSante. 1993. Handbook of field methods for monitoring landbirds. General Technical Report PSW-GTR-144. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture.

Sikes, R. S., E. Paul, and S. J. Beaupre. 2012. Standards for wildlife research: taxon specific guidelines vs. Public Health Service Policy. BioScience 62(9):830-834.

Wallace, M. C. and H. Curzer. Eds. 2013. Ethical and IACUC considerations for field biology considerations. ILAR Journal 54(2): in press.

viii. **Animal Reuse** [*Guide*, p. 5]

1) Describe institutional policies regarding, and oversight of, animal reuse (i.e., on multiple teaching or research protocols).

Issues of animal reuse are carefully considered by the TTU IACUC upon submission of an animal use protocol wherein the stated source of animals is from another study protocol. Animal reuse is typically not approved by the IACUC unless there is clear evidence that reuse will not have adverse effects on animals used in research, testing, or demonstration. Multiple teaching protocols may be approved for use of TTU horses provided that appropriate care is provided and no horse is subjected to overuse or procedures causing undue stress or harm. Dogs may be transferred to teaching protocols and protocols that involve adoption events. The IACUC gives due consideration for humane animal care, but also acknowledges the 3R's which dictate that the number of animals be reduced to the minimum required.

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2) Briefly describe the types of activities currently approved that involve the reuse of individual animals.
Note: A list of specific protocols involving reuse of animals should be available during the site visit.

When appropriate and not detrimental to the animal, animals may be reused on teaching and research protocols. Each protocol is considered on a case-by-case basis by the IACUC as to whether the additional procedures would impose a burden on the animal verses the benefits gained by reducing the number of animals used. The TTU IACUC has approved protocols for reuse of dogs and cats (when they serve as their own controls in behavior-based studies- 17010-02), Protocols 18041-05, 16079-08 cannulated steers- when multiple experiments can be completed using these specially modified animals, and protocols involving livestock on multiple feeding studies wherein previous experimentation will not confound additional studies. Equestrian and rodeo teams reuse animals in order to prepare for competitions. Staff track the reuse of horses and livestock to assure that they are not used in excess. The TTU IACUC will not approve reuse of animals that undergo survival surgery, painful or stress-inducing procedures, or in cases involving aged animals (typically rodents).

3) Describe other instances where the final disposition of animals following study does not involve euthanasia, including adoption, re-homing, rehabilitation, etc.
Note: A list of specific protocols involving reuse of animals should be available during the site visit.

Many agricultural studies involve feeding trials or other non-invasive/non-contaminating studies that allow the animal to go back into production. These animals would be transferred from the experimental protocol back onto the maintenance protocol. Dogs at the New Deal dog colony are not owned by TTU. They are on loan from a local shelter for research and teaching (training) purposes and upon completion of the project are returned with added value for adoption to the public. Animal adoption will be considered on a case-by-case basis. See TTU Policy 28.

2. Post-Approval Monitoring [*Guide*, pp. 33-34]

a. Describe mechanisms for IACUC/OB review of ongoing studies and periodic proposal/protocol reviews (e.g., annual, biennial, triennial, or other frequency).

Texas Tech takes a collaborative approach to post approval monitoring that strives to foster a relationship between animal care staff, the IACUC committee, and the PI. Rounds are conducted to look at all animals and the environment in which they live compared to the approved protocols and facility SOPs, following SOP018. The Attending Veterinarian, Clinical Veterinarian, Post-Approval Monitor, and ACS Facilities Manager conduct monthly rounds at a minimum. The IACUC reviews protocols each year by an Annual Review and Progress Report that is provided by the PI. After 3 years, a protocol is terminated and a new

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de novo protocol is submitted to be reviewed by the IACUC if the study is to continue. The IACUC committee also conducts semi-annual program review and facility inspections as post approval monitoring.

Additionally, the Post-Approval Monitor conducts live monitoring sessions on protocols when experiments are being conducted. Monitoring sessions are typically scheduled in advance with PIs or may be impromptu if the PAM is visiting animal facilities and observes animal work in progress. The PAM may also request PIs to submit pictures and videos of procedures in the field as part of continuing protocol review. The PAM uses these sessions to ensure animal well-being, refine procedures and techniques, and help PIs maintain compliance with approved protocols, university policies and SOPs, and regulations. Any deficiencies are reported to the PI with the PAM's recommendations for resolution, and to the IACUC during monthly meetings who may add to the suggested resolution. In the event a non-compliance issue was cited, then a PAM might be conducted more frequently as needed (weekly, monthly, quarterly) as a follow-up on corrective actions. The PAM is also used in cases of re-training or newer procedures that are novel to the IACUC committee. The PAM program works with and in support of PIs to assist in cultivating a culture of regulatory compliance and assuring good science (Policy 13).

b. Describe the process and frequency with which the IACUC/OB reviews the program of animal care and use.

The Program and Facilities are reviewed by the IACUC every six months (April and October). The Attending Veterinarian, Clinical Veterinarian, Post-Approval Monitor, and ACS Facilities Manager conduct rounds on a monthly basis in all animal housing facilities. Additionally, the Post-Approval Monitor conducts sessions on projects when experiments are being conducted. In the event a non-compliance issue was cited, then a PAM might be conducted more frequently as needed (weekly, monthly, quarterly). The PAM and Facilities Manager also conduct, at a minimum, monthly rounds to ensure all PIs are following protocol.

Within a week following semi-annual inspections, the IACUC Chair sends a letter to the PI and the Chair of the department responsible for correcting the deficiency notifying them of the deficiency and providing a timeline in which correction of the deficiency must take place. The IO is also provided a report identifying significant facility or programmatic deficiencies. The PAM and Facilities Manager also conduct, at a minimum, monthly rounds to ensure all PIs are following protocol.

c. Describe the process and frequency with which the IACUC/OB conducts facility and laboratory inspections.
- Describe the rationale or criteria used for exempting or varying the frequency of reviewing satellite holding facilities and/or animal use areas.
- If contract facilities or contractor-provided personnel are used, describe procedures used by the IACUC/OB to review such programs and facilities.

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Note: A copy of the last report of these reviews should be included as **Appendix 10**.

The Program and all animal facilities are reviewed by the IACUC every six months (April and October). The ILAR Guide, the AWA and the Ag Guide are used as the basis for review. The OLAW checklist is used during semi-annual review. The Attending Veterinarian, Clinical Veterinarian, Post-Approval Monitor, and ACS Facilities Manager conduct rounds on a monthly basis in all animal housing facilities both on and off campus, including the satellite facility. A Laboratory Safety Manager inspects the on-campus animal facilities annually. A member of EHS serves on the IACUC. ND White inspects air handlers and provides a report of room pressures every 3 years.
All animal facilities, including satellite, or off-campus facilities are reviewed every six months utilizing the same criteria. TTU does not have any contract facilities.

d. If applicable, summarize deficiencies noted during external regulatory inspections within the past three years (e.g., funding agencies, government, or other regulatory agencies) and describe institutional responses to those deficiencies. *Note:* Copies of all such inspection reports (if available) should be available for review by the site visitors.

USDA Annual Unannounced visits- no deficiencies noted for the past 3 years.
Elanco Animal Health- "considered Good in regard to Animal Welfare for collaboration with Elanco"

e. Describe any other monitoring mechanisms or procedures used to facilitate ongoing protocol assessment and compliance, if applicable.

Post-Approval Monitoring sessions are conducted in-person or via pictures and video. The PAM uses these sessions to assess animal well-being, help PIs maintain compliance, and for procedure refinement. The Attending Veterinarian and Clinical Veterinarian each conduct veterinary rounds to all animal facilities at least once per month and generate a veterinary report that is provided to the IO, IACUC chair and coordinator. On these rounds, animal health and husbandry are observed as well as facilities and records. The PAM and Facilities Manager also conduct, at a minimum, monthly rounds to ensure all PIs are following approved protocols.

3. Investigating and Reporting Animal Welfare Concerns [*Guide*, pp. 23-24]
Describe institutional methods for reporting and investigating animal welfare concerns.

Signage is posted at each animal facility and laboratory using animals, as well as on our website, identifying procedures to report animal mistreatment or complaints without fear of reprisal. Complaints may be anonymous and an investigation will occur. Employees who make complaints about animal mistreatment may be entitled to certain protections under law

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and/or TTU policy (TTU OP 74.08). Complaints may be made to the IACUC coordinator via a phone call or email, or to any IACUC member or ACS staff. The IACUC will investigate the concern and communicate the findings to the reporting party and IO. The report includes findings and any corrective action. Animal welfare concerns or other non-compliance findings may need to be reported to governing bodies, such as OLAW, USDA or AAALAC.

4. **Disaster Planning and Emergency Preparedness** [*Guide* p. 35]
   Briefly describe the plan for responding to a disaster potentially impacting the animal care and use program:
   - Identify those institutional components and personnel which would participate in the response.
   - Briefly describe provisions for addressing animal needs and minimizing impact to animal welfare.

   Note: A copy of disaster plan(s) impacting the animal care and use program must be available for review by the site visitors.

The Emergency Management Organization includes all departments, and individuals that have a direct responsibility for public safety, security, or protecting assets and resources as outlined in the Texas Tech University Emergency Management Plan and supplemented with the TTU ACS Disaster/Crisis Manual.

Line of Authority: The AV/ACS Director will have responsibility for overseeing emergency response for all on-campus facilities. The AV will have responsibility for overseeing animal care and initiating a quick return to full animal care. The Facilities Manager will have responsibility for all on-campus facilities. Unit managers or PIs will have responsibility for all off-campus facilities. For animal emergencies, the TTU veterinarians should be notified immediately.

An Emergency Action/Disaster Plan is located within each animal facility and outlines responses based on the event. Emergencies may be categorized by level of impact, ranging from equipment failure to major damage caused by a tornado. The operational organization needed to respond to each level of emergency depends upon the size and complexity of the emergency.

General Emergency Animal Care: Veterinarians and animal care technical staff have a responsibility to the animals used in the teaching and research programs. However, in an emergency, human life will take precedence over animal life. Animal care personnel must not place themselves or their co-workers in danger to evacuate animals. Directors, Managers, veterinary staff, technicians, and others will work in cooperation with the local authorities and others to determine the appropriate course of action based on the individual emergency situation.

A Level 1 emergency may be localized and require only that animals be relocated to another room or facility. A Level 2 or 3 emergency may require the evacuation and/or euthanasia of animals. The AV/Director, in consultation with other emergency responders, will determine if

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an animal evacuation is necessary and will initiate the process. Because of the potential detrimental effect on research outcomes, animals will be euthanized only as a last resort, when relocation or evacuation options are unavailable. Euthanasia will be performed in a humane manner under the direction of the veterinary and veterinary technical staff.

II. Animal Environment, Housing and Management

Note: Complete each section including, where applicable, procedures performed in farm settings, field studies, aquatic environments, etc.

A. Animal Environment

Note: Facility-specific details regarding mechanical system construction and operation is requested in Section IV.B.5. and **Appendix 11**; current (measured ***within the last 12 months***), detailed (by room) performance data must also be provided as indicated in **Appendix 11.**

1. Temperature and Humidity [*Guide*, pp. 43-45]

a. Describe the methods and frequencies of assessing, monitoring, and documenting that animal room or housing area temperature and humidity is appropriate for each species.
Note: If preferred, this information may be provided in a Table or additional Appendix.

Appendix 11 provides the HVAC System performance data; a process conducted every 3 years.

Temperature and humidity should be within limits of the appropriate guidelines unless specifically justified. Indoor animal room temperatures and relative humidity are consistent with those in the ILAR Guide or Ag Guide and minimum and maximum readings are recorded daily by animal care personnel using a digital thermometer located in the animal room.

ESB I, II and AFS has a building monitoring system; emergency maintenance will notify the ACS Facility Manager when temperatures are outside the set parameters. If at any times, an animal room falls outside the set parameter for temperature, it is reported to the Facilities Manager who then determines when Physical Plant needs to be contacted for it to be corrected. Portable AC units and heaters are available and used when necessary to stabilize temperatures until the issue is resolved. A more-detailed procedure can be found in SOP074 Supplemental Temperature Control in On Campus Facilities.

ESB II is also equipped with the Edstrom Pulse Monitoring system. When temperature, humidity lighting is outside set parameters, the facilities manager is notified and will assess the situation.

Outdoor housing is used for horses, cattle, sheep, goats, deer, and some swine.

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It is extremely difficult to maintain humidity within the set parameters of 30-70% due to the fact that we are in a semi-arid region and do not have humidity control within our buildings, except ESB II. Animals are regularly monitored for signs of adverse effects of low humidity, such as ringtail, infertility or cannibalism of pups. We have not seen clinical symptoms that are associated with low relative humidity.

In some instances, i.e. tropical snakes, we have added humidifiers to aid in increased humidity.

b. List, by species, set-points and daily fluctuations considered acceptable for animal holding room temperature and relative humidity.
Note: If preferred, this information may be provided in a Table or additional Appendix. [*Guide*, pp. 44 and 139-140]

Species	Temp set point; range (°F)	Humidity set point; range* (%)
Mouse, rat	73; 68-79	30-70
Rabbit	68; 61-72	30-70
Cat, dog	70; 64-84	30-70
Pig	70; 61-90 (age dependent)	30-70
Calf	70; 61-81	30-70
Chickens	70; 70-90 (age dependent)	30-70
Ferret	70; 61-75	30-70
Reptiles	80; 78-85	30-70
Quail	70; 60-81	30-70

*Current buildings do not have humidity control, except for ESB II.

c. Temperature set-points in animal housing rooms and/or environmental conditions are often outside of the species-specific thermoneutral zone. Describe the process for enabling behavioral thermoregulation (e.g., nesting material, shelter, etc.) or other means used to ensure that animals can control their thermoregulatory environment. Include a description of IACUC/OB approved exceptions, if applicable. [*Guide*, p. 43]

Outdoor animals have access to shade, sprinklers, hills or shelters. In addition, they have access to clean, fresh water ad libitum.

Rodents are provided with nesting material and huts. Rodents are generally group housed unless scientific justification or veterinary concerns warrant individual housing.

Tropical snakes have heat tape set up along one side of their enclosures. Each line of heat tape is set up to a thermostat that lowers the temperature of the heat tape in the evenings. The snakes can retreat to the opposite side of the enclosure to escape the heat tape when necessary.

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Chuckwallas are provided heat lamps. These lamps are located on one side of the enclosure and are on a light timer with a 12/12 light/dark cycle. They are also provided with rock structures hides to escape the heat lamps.

The chickens are group housed. The flooring of the chicken room is covered in aspen wood shavings and is maintained at a temperature range between 70° and 85° F based on the following:

- From the day of hatch until 1 week of age, the temperature in the room should be 85°F. The cages will have supplemental heat lamps located on one side of the pen to supply needed heat (90ºF) for the chick and a thermometer will be placed on the outside of the unit (in close proximity to the heat lamps) to monitor temperatures. The pen is large enough for the chicks to move to the opposite side of the pen to escape the heat lamp when necessary.
- After the first week of age temperatures will be decreased to 80° F + or – 2 degrees.
- The heat lamps will be removed, and the temperature will be reduced by 5° per week, until reaching 70°F. The temperature will be kept at 70°F for the remainder of the study.

**Note: If at any time the birds are panting, this is a sign that they are too hot. The temperature will be lowered appropriately.

The pigs at AFS are group housed when possible to allow for huddling behavior. Temperature is controlled. Baby and nursery pigs are provided supplemental heat lamps.

Ferrets have tunnels and hammocks and are typically socially housed.

Leopard frogs are group housed and are provided with PVC tubing and moistened peat moss bedding.

Dogs and cats are pair housed when compatible and are provided bed and blankets.

Quail brooders provide controlled supplemental heat as appropriate for age.

Protocols 18038-04 and 19034-04 have temperatures at 27°C (80.6°F) and 30°C (86°F) respectively. Both these protocols are studying thermogenesis in mice. Housing mice at warmer temperatures in the UCP1 KO mice induces obesity. No ill effects have been observed in mice housed at these temperatures.

Protocol 18032-12 has temperatures from 5 - 11ºC (41 – 51.8ºF) and 87.5 – 92%RH. These temperatures and humidities reflect the natural conditions of the bats during hibernation. It is the study objective to observe the effects of fixed or rover caging at these conditions.

2. **Ventilation and Air Quality** [*Guide*, pp. 45-47]

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a. Describe the methods and frequencies of assessing, monitoring, and documenting the animal room ventilation rates and pressure gradients (with respect to adjacent areas).
Note: If preferred, this information may be provided in a Table or additional Appendix.

Ventilation performance is assessed with the assistance of the Physical Plant who contracts with an outside company (ND White). Such measurements are empirically conducted on a three-year basis and "for cause" such as after repair of the HVAC equipment; to confirm that relative air pressure has been changed (e.g. positive to negative); or when problems arise (e.g. strong odors, rushing noise when doors are opened, stagnant air, etc.). Where applicable, relative pressure differentials are monitored weekly in on-campus animal facilities using a smoke test to insure that the room is negative to the corridor. ESB II has room level visual pressure monitoring. All rodent housing is in individually ventilated caging (IVC) units with local monitors and air flow alarms.

Bats are housed in environmentally controlled chambers to simulate hibernation. The air flow in the chambers are approximately 300 cfm, which is 10 air changes per minute.

For indoor farm facilities (Swine Center only), ventilation is variable with 10 to 60 air changes per hour, depending upon season. Ventilation is always 100% fresh air. One swine unit building has natural ventilation (curtains that open). Animal facilities in the ESB I and II, BSB, AFS, HSB and TIEHH are maintained at a minimum of 10-15 air exchanges per hour. Air is supplied by diffusers in the ceiling and exhausted to the outside. No air is recycled. Ventilation rates and pressure gradients are provided in Appendix 11.

At the Erskine quail facility the room ventilation lies between 0.75 and 1.5 cfm per pound of body mass depending upon season. These values can be used to calculate the animal capacity of the rooms in the quail facility. Room 6 is sealed except for air coming into the room from the HVAC system and air removed from the room through a fan, which removes 120 cfm directly outside the building. Using the upper value of 1.5 cfm per pound of body mass the ventilation in the room would be sufficient for a maximum body mass of 80 pounds. Adult quail average 0.44 pounds, so the room could hold 182 adult quail. Airflow through ventilating ducts is checked once per month using an anemometer when birds are present in the rooms.

*Bell, D. D. and W. D. Weaver. 2002. Commercial Chicken Meat and Egg Production, 5th Edition, Springer-Verlag, New York, New York.

b. Describe ventilation aspects of any special primary enclosures using forced ventilation.

All rodents are housed in HEPA filtrated, individually ventilated cages. The ventilation of such caging is provided by a separate trolley blower unit and is adjustable to be either positive or

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negative relative to the room and can be run at up to 70-80 air changes per hour. Influenza-infected ferrets are housed in HEPA filtered, individually ventilated cages.

c. If any supply air used in a room or primary enclosure is recycled, describe the percent and source of the air and how gaseous and particulate contaminants are removed.

Air source is 100% fresh

3. Life Support Systems for Aquatic Species [*Guide*, pp. 84-87]

a. Provide a general description of institutional requirements for enclosures using water as the primary environmental medium for a species (e.g., aquatics).

The Guide for the Care and Use of Laboratory Animals, Eighth Edition is used as the primary reference for species-specific housing size and volume requirements; animal densities; water quality; life support systems; and sources of water. As per the Guide, there exists extreme variation in ranges of these factors among species that are necessary to support healthy populations. IACUC committee members evaluate all of the needs of each aquatic species on a case-by-case basis during protocol reviews and evaluations. Standard operating procedures are provided and are generally lab specific to each housing location and species.

b. Provide a general description of overall system(s) design, housing densities, and water treatment, maintenance, and quality assurance that are used to ensure species appropriateness.
Note: Facility-specific tank design and parameter monitoring frequencies should be summarized in **Appendix 12** (Aquatic Systems Summary).

Vertebrate aquatic organisms are housed in aquaria, living streams, circular fiberglass tanks, or other appropriate containment systems commonly used to house aquatic vertebrates. These vary by species and may range from the fully automated aquatic rack systems commercially available for culturing zebrafish (*Danio rerio*) to simple manually maintained aquaria. Organism density is species-specific as some social species do better in captivity when housed as a group and others may be less social, in which case density may be very important in health and well-being. Densities are based on the species-specific life histories of the organism, as well as peer-reviewed publications reporting housing conditions of the species.

Life support systems are provided to maintain water quality parameters at levels that are within the range observed in natural habitats of the species. Life support systems range from flow-through systems containing biologically activated filter substrates for oxygenating water and carbon-based filtration for binding organics to simpler aquarium filters. If filtration is not available, water exchanges with freshly prepared and oxygenated water will occur. Monitoring of dissolved oxygen occurs weekly in order to trigger the need for water exchanges.

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Specific water quality parameters are monitored and include temperature, salinity, pH, and dissolved oxygen. Daily and weekly parameters are protocol specific. Acceptable ranges are species-specific as tolerances to water quality parameters vary dramatically across species. Dissolved oxygen in culturing and breeding protocols remains above 3 mg/L as this threshold leads to stressful conditions and ultimately mortality for most aquatic species. Water temperature is maintained by manipulating room temperatures; however, some systems may use supplementary water heating and chilling mechanisms integrated into the circulation system or submerged within the living space. Conductivity and salinities is adjusted based on the life history of vertebrate species used. For freshwater species, dechlorinated tap water or reconstituted water is used. Reconstituted water is prepared using deionized water and a series of salts as recommended within standard methods to achieve the desired water hardness, conductivity, and salinity.

TIEHH Zebrafish (SOP040): Fish will be kept on a recirculating rack system or in single aquaria in an area designated for aquatic species breeding and holding. Single aquaria may be used for breeding.
Zebrafish Housing Rack**:**
The Aquaneering system is a vertical rack system. The onboard water delivery and drainage system are easily removable for cleaning and maintenance. Water flow is metered by individual valves, allowing a variety of flow rates to individual tanks. Drain troughs and piping are constructed from clear PVC for convenient monitoring of waste water flows. The Aquaneering system employs a four-stage filtration system:

1. The first stage is a stainless steel reusable screen, trapping particles greater than 10 microns, and can be easily removed for washing or disposal.
2. Water is then pumped into the fluidized bed biological filter. High pressure water from submerged pump, is forced into the bottom of the fluidized bed, suspending and mixing the filter media to prevent channeling and insure full utilization of the entire surface area. This filtration design provides over 4000 sq. ft. of surface area on which biological conversion of harmful ammonia can occur.
3. Water then flows into the second sump chamber, which contains a microprocessor controlled, 1000-watt heater to maintain a temperature throughout the rack. Dual carbon filters lay submerged in the second sump chamber, and a dedicated submersible pump draws water through and pressurizes the rack supply lines.
4. On the main supply line is an in-line UV sterilizer lamp that provides a minimum of 100,000 microwatts/second/cm^2 at our flow rate of 6 water changes per hour.

Water quality:
Temperature is continuously measured with in-line heater and thermometer. Weekly measurement of Ammonia (< 0.02 ppm), nitrite (< 1 ppm), nitrate (< 20 ppm), pH (7.0 – 7.7), dissolved oxygen (> 6 mg/L), total hardness (200-300 mg/L) and alkalinity (100-150 mg/L) with allowable ranges are in parentheses.

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A 25% water exchange is performed twice weekly to allow maintain proper water levels and add new water to the system.

Housing Density:
Adult fish are maintained at no more than 5 fish/L. Juvenile fish density is no more than 10 fish/L. Larval zebrafish density is no more than 50 fish/L.

TIEHH Fathead Minnow
Housing:
Adult *Fathead minnow* will be held in large circular aquaculture tanks that holds 400 gallons of water. Water will be recirculated through biofilters, aerated through air stones and temperature maintained at 25°C. 25% water exchange will be performed twice weekly. Adult fish density will be no more than 5 fish/L. Juvenile fish density will be no more than 10 fish/L. Larval fish density will be no more than 50 fish/L. Eggs - Larva will be raised in glass aquaria heated to 25°C, and will include biofilter and aquaria. Breeding takes place in adult tank, using PVC pipes so females can lay eggs. After successful breeding eggs will be placed aquaria set-up for eggs - larva.

Water quality:
Temperature is continuously measured with in-line heater and thermometer. Weekly measurement of Ammonia (< 0.02 ppm), nitrite (< 1 ppm), nitrate (< 20 ppm), pH (7.0 – 7.7), dissolved oxygen (> 6 mg/L), total hardness (200-300 mg/L) and alkalinity (100-150 mg/L) with allowable ranges are in parentheses.

A 25% water exchange is performed twice weekly to allow maintain proper water levels and add new water to the system.

Biology Xenopus (SOP003): Living streams, Glass or plastic aquaria, Flow through recirculating tanks

Housing System:
Static glass/plastic aquaria or Living streams (trout tanks): water levels are monitored daily. Water depth should be at least 3 inches. If water depth is less than 3 inches, dechlorinated water is added to reach the correct depth. Water is changed 3 times weekly using DI water containing 0.3 g Instant Ocean per liter. Dirty tanks are washed with white vinegar and DI water and left to air dry. Trout tanks are vacuum siphoned 3 times weekly to remove debris. As the water is changed, the sides of the tanks are wiped down to remove any deposits.
Aquatic Ecosystems recirculating tanks: water level should be at the line marked ‘max water level’ (see figure below). Water is changed weekly using DI water containing 0.3 g Instant Ocean per liter. A vacuum siphon is used to clean debris 3 times weekly. The filters are cleaned every 2 weeks. As the water is changed, the sides of the tanks are wiped down to remove any deposits.

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Water Quality: Parameters are tested once weekly and include water temperature, pH, NH_4, NO_2, NO_3. Testing is done with commercially available kits (e.g. Tetra EasyStrips, API water drop kits) following the manufacturer's instructions.

Housing Density: Adult frogs- 2 L/frog

Biology/TIEHH Shiners (SOP001)

Housing system:

Closed Recirculating

1. The biological filtration system for a closed recirculating system should be "primed" by the addition of either an approved hardy disease-free fish or ammonium chloride (5 mg/L/day). Since the detoxifying capacity of a biological filter adapts to its nutrient supply, the capacity of a seeded or "seasoned" biofilter should be considered prior to the introduction of the entire fish population.
2. Water parameters (e.g. ammonia and nitrite levels) of the system should initially be monitored every other day until they stabilize to safe levels.
3. Considering the naturally high pH levels of water available at Texas Tech University and the tendency of ammonia to exist in its more toxic form in alkaline waters, measurement of the nitrogenous waste products is critical in newly established aquatic systems.
4. The testing interval can be lengthened to weekly checks for pH, ammonia, nitrites and salinity (for marine systems) once these parameters measure within the safe range.

Flow-through

1. Water is constantly replaced and may use large volumes of water.
2. Required water turnover rate (tank volumes per day) may vary depending on fish density. It must be set at a value capable of maintaining water quality parameters within acceptable values.

Static

1. Water is stationary and periodically replaced (partially), and may use mechanical devices to move and aerate water.
2. Required frequency of replacement depends partly on fish density and must be set at rate that maintains water quality parameters within acceptable values. Typically every other day to weekly.

Water Quality:

1. If a municipal water supply is used the water must be dechlorinated. All water should be analyzed prior to use.
2. Use a Daily Observation Form and the Required Water Analysis chart to record data. Check water quality prior to use and adjust accordingly.
3. Daily- Check water temperature in tanks/aquaria
4. Weekly
    - Nitrites: should always remain at 0 ppm, reduce if elevated.
    - Ammonia: should always remain at 0 ppm, reduce if elevated.

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- pH: should be in the range of 6 - 9 pH units and adjusted according to optimal conditions for the species being held.
- Dissolved Oxygen should be >4.5 mg/L.

5. New tanks and aquariums
   - Initial record of various water quality parameters should be made every other day until stabilized (4-6 weeks) then weekly as above regarding the natural quality of the water source prior to its use in an artificial aquatic system to document both the high alkalinity and pH values. The following water quality parameters should be made on new aquariums:
     a. pH
     b. Alkalinity
     c. Hardness
     d. Chloramines
     e. Dissolved oxygen
   - Life support systems must be set up and acclimated prior to receiving new fish. Life support systems typically fall into three categories: closed recirculating, flow-through or static. The water may be fresh, brackish or salt and is maintained at specified temperatures depending the species.

Housing Density:
Numbers of fish housed in various aquaria, listed below, are based on biomass. Adult shiners weight approximately 1 gram. Larval fish, through the ages and sizes we hold them (up to 25 mm total length) weight less than 0.2 g. we based fish densities on these two nominal weights and attempt to maintain fish densities of approximately 0.5g/L. In a description of methods for breeding Fathead Minnows, USEPA 2006) recommended a broodstock density of 30-35 fish per 37 L. Fathead Minnows are similar in size and weight to the shiners we breed, so their recommended density is twice that used in our breeding/rearing operations. (USEPA. 2006. Culturing of Fathead Minnows (*Pimephales promelas*). Supplement to Training Video. EPA-833-C-06-001.)

All organisms are fed appropriate diet items ad libitum, or on a clearly specified schedule depending upon species-specific feeding regimens.

For each system, all monitoring, feedings, observations, and maintenance tasks are recorded on the appropriate sheet in the logbook for each room.

4. Noise and Vibration [*Guide*, pp. 49-50]

Describe facility design features and other methods used to control, reduce, or prevent excessive noise and vibration in the animal facility.

Noise reduction is accomplished by providing buffer zones between high noise support areas and animal housing areas. Each facility has interstitial spaces located above each floor and contains all the mechanical components to supply each floor. The HVAC, water supply, electrical, and data cabling are set in this area and are accessible to facilities operations with

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minimal disruption to the animal spaces below. Representatives from the Department of Environmental Health and Safety check decibel levels in areas suspected of being noise hazards. No regularly used background noise is in use. Ear protection is highly recommended and provided at the swine center, feed mill and at the New Deal dog colony.

The Experimental Sciences Buildings I and II were built to be vibration sensitive. The location of the animal facility is one of the most vibration free portions of the building since it is in the basement and facilities were designed so that cage washing areas are separated from housing areas. Soundproofing this area has not been a concern. The physical location of the facility is probably the biggest factor here since this is a low traffic area. In ESB II, the animal facility is the only area in the basement and has badge limited access to foot traffic.

In AFS, dogs and pigs are housed at different times or separate location from other species.

B. Animal Housing (all terrestrial, flighted, and aquatic species)

1. Primary Enclosures

Note: A description of primary enclosures used (e.g., cages (conventional, individually-ventilated cage systems (IVCS), etc.), pens, stalls, pastures, aviaries, tanks) should be included in **Appendix 13**.

a. Describe considerations, performance criteria and guiding documents (e.g. *Guide*, *Ag Guide*, ETS 123 and/or other applicable standards) used by the IACUC/OB to verify adequacy of space provided for all research animals, including traditional laboratory animal species, agricultural animals, aquatic species, and wildlife when reviewing biomedical, field and agricultural research studies.

The Guide, Animal Welfare Act and the Guide for Agricultural Animals Used in Agricultural Research and Teaching are the references used to determine cage size and housing densities for all animals used at Texas Tech University. In addition, performance standards data are used in determining any exceptions to the Guide on a case-by-case basis. Any exceptions must be approved by the IACUC.

b. Describe space exceptions to the guiding documents (*Guide*, *Ag Guide*, ETS 123, and/or applicable standards), indicating the references, considerations and performance criteria used (e.g., by the IACUC/OB) to verify adequacy of space provided for all animal species covered by the program. [*Guide*, pp. 55-63]

Exceptions to the guides must be reviewed and approved by the IACUC. Sows used in biomedical studies that are due to farrow are housed in pig farrowing crates (18007-01) until weaning. Farrowing crates insure the safety of the piglets by reducing accidental crushing by the sow. Piglet survival is important to the success of the research.

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2. **Environmental Enrichment, Social, and Behavioral Management** [*Guide*, pp. 52-55; 63-65: *Ag Guide*, Chapter 4]

   a. **Environmental Enrichment**

      i. Describe the structural elements of the environment of primary enclosures that may enhance the well-being of animals housed (e.g., resting boards, privacy areas, shelves/perches, swings, hammocks).

Dogs and cats are provided resting boards. Cats are provided a scratching post and towel or cat bed. Rodents are provided tunnels or huts. Rabbits are provided resting shelving. Ferrets may be provided hides/tunnels and hammocks. Reptiles and amphibians are provided plastic tubes, floating mats, natural rocks or bricks. Livestock are provided with a loafing shed. Outdoor quail are provided with a shelter in the form of natural habitat (vegetation, branches) or enclosed hutch. Deer are provided a 3-sided shelter or metal roofed shade in an enclosed pen with brush/grass.

      ii. Describe nonstructural provisions to encourage animals to exhibit species typical activity patterns (e.g., exercise, gnawing, access to pens, opportunity for exploration, control over environment, foraging, denning, burrowing, nesting materials, toys/manipulanda, browsing, grazing, rooting, climbing).

Dogs housed at New Deal have supervised off-leash play time twice daily in play yards with compatible dogs or individual play with a human caretaker and toys if a dog is incompatible with all other dogs. Dogs also receive twice daily walks and positive reinforcement-based training several days a week. Dogs have 24 hour indoor/outdoor access and free choice where to stay. Dogs have toys daily and are rotated between squeak toys, frozen food toys, kongs, ropes, and bones unless a dog is incompatible with a specific toy type. Cats are kept in social pairs and are given a scratching post for scratching and climbing, and cat toys are provided. Rodents may be provided with gnawing blocks/sticks, hides (huts and tunnels) and nest building material. They may also be provided with an exercise wheel or trapeze for exercise or climbing. If rats are singly housed, they may have time in an enrichment pen (4’ x 2’) provided with large PVC tunnels, balls, enviro-nesting packs, nylon bones and food for foraging. Rabbits are provided alfalfa hay cubes and bunny chew blocks and flexi-keys for chewing, steel hanging enrichment and balls. An enrichment pen (4’ x 4’) is provided for exercise and exploration: large hide or shelf, balls, rattles, treat foraging box, and stainless-steel feeder with fresh produce. Ferrets are provided with manipulanda: nylon chew bones, kongs, balls, nesting/foraging boxes, and treats, and hammocks. Pigs in dry lots have access to a wallow. Pigs in the swine barns are provided hanging chains, rooting devices or auditory enrichment. Laboratory pigs are given rotating enrichment made up of balls, chains, Porci-chew, chew/destructible items, ropes, feed bags, rooting/tossing materials, auditory enrichment and food/treats when the study allows. Quail are provided a cuttlebone, dust baths or gravel scratching paper. Sheep are provided with auditory sensory enrichment and balls. Chickens are given dust baths, meal worm foraging boxes, and provided with a perch starting at

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approximately 3 weeks of age. Large snakes are given exercise time outside during cage changes and are provided with time to climb on an enrichment board.

b. Social Environment [*Guide*, p. 64]

i. Describe institutional expectations or strategies for social housing of animals.

Social housing is the standard for housing social species at TTU. Single housing of social species is considered an exception at TTU and must be justified on experimental requirements or veterinary related concerns regarding animal well-being, SOP027. Animals of each species are group housed whenever possible to provide for or enhance conspecific interactions. For example, livestock are either group housed on pasture or kept in stalls that allow visual, olfactory and auditory contact with other animals. Animals are individually housed if required by the experimental protocol or to protect the health of the animal or its conspecifics. Rarely, there are not enough animals of the same species and health status to allow group housing. In such cases, every effort is made to minimize the length of time individual animals remain isolated. In the event a social animal must be individually housed, this must be justified and approved by the IACUC, and additional steps should be made to provide other physical enrichment opportunities.

ii. Describe exceptions to these expectations (e.g., veterinary care, social incompatibility) and other typical justification approved by the IACUC/OB for housing animals individually.

The IACUC recognizes that not all members of a social species are compatible and there are circumstances when social housing is not possible or recommended. These include veterinary concerns, social incompatibility, post-operative recovery, attrition and breeding/lactating animals. When experimental design or veterinary concerns require social animals to be housed individually, justification is carefully evaluated by the IACUC and is limited to the minimum amount of time necessary. In such cases, efforts are made to provide for visual, auditory, olfactory and/or tactile contact among individually housed social animals. Further, if no other animal contact is possible, positive interaction with animal care staff and/or other enrichment items are provided.
Several nutritional sciences and behavioral studies involving mice have individually housed animals due to feed intake measurement, restricted diet or fecal collection. Xenopus are individually housed throughout behavioral testing to keep environmental conditions consistent. Rabbits and occasionally dogs are housed individually due to incompatibility. Ferrets are group housed until they are challenged with Influenza, then they are housed individually in individually ventilated caging. Quail are individually housed for food intake and fecal collection. Sheep are individually housed for feed and fecal collection to determine biomarkers. Ruminally-cannulated steers are individually housed when on feeding trials, however, they are given a rest period in between each trail that allows for outdoor, group housing, and are housed in groups on dirt lots when not on study.

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iii. Describe steps taken with isolated or individually housed animals to compensate for the absence of other animals (interaction with humans, environmental enrichment, etc.).

Animals are housed in social groups or with social contact where appropriate and possible. When animals must be housed alone, efforts are made to provide for visual, auditory, olfactory and/or tactile contact among individually housed social animals. When single housing is justified, additional steps are taken to provide additional enrichment, more frequently rotated enrichment, and/or human interaction. Rodents that are individually housed must be provided with a shelter and nesting material unless scientifically justified. An exercise or enrichment pen can be provided to allow for novel opportunities which can include supervised conspecific play time. Enrichment may also be rotated more frequently. Further, if no other animal contact is possible, positive interaction with animal care staff are provided; e.g. rabbits are held and brushed, companion animals are played with, petted, walked and given treats.

c. Enrichment, Social and Behavioral Management Program Review [*Guide*, pp. 58, 69]
Describe how enrichment programs and exceptions to social housing of social species are regularly reviewed to ensure that they are beneficial to animal well-being and consistent with the goals of animal use.

Exceptions to social housing is reviewed during specific protocol review as well as during IACUC semi-annual review. The veterinarians and animal care services staff review facilities on a weekly and monthly basis to assess health and animal well-being. Our PAM has a special research interest in animal enrichment and has conducted studies looking to improve animal well-being (Backus et al., 2017; Backus and McGlone, 2018). The PAM oversees our entire enrichment program and works with PIs to find enrichment that won't compromise their experiments. PIs are typically open to providing and rotating enrichment items. Occasionally, enrichment is withheld due to experimental purposes in behavioral studies.

Backus BL, Sutherland MA, Brooks TA. 2017. Relationship between environmental enrichment and the response to novelty in laboratory-housed pigs. JAALAS 56: 735-741.

Backus BL, McGlone JJ. 2018. Evaluating environmental enrichment as a method to alleviate pain after castration and tail docking in pigs. Appl Anim Behav Sci 204: 37-42.

d. Procedural Habituation and Training of Animals [*Guide*, pp. 64-65]
Describe how animals are habituated to routine husbandry or experimental procedures, when possible, to assist animals to better cope with their environment by reducing stress associated with novel procedures or people.

Upon arrival, animals go through an acclimation period of various lengths, depending on species (TTU Policy 08) to help them adjust to their new environment. Pre-procedural habituation is required when animals are used in procedures wherein physiological or behavioral endpoints are monitored that could be influenced by novel environmental

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conditions. Every attempt is made to habituate rodents, rabbits, pigs and ferrets to experimental manipulations. If an animal is unable to habituate then it is often removed from the study.

e. Sheltered or Outdoor Housing [*Guide*, pp. 54-55]

i. Describe the environment (e.g., barn, corral, pasture, field enclosure, flight cage, pond, or island).

Farm and wildlife facilities have shelter or outdoor housing including those for swine, cattle, horses, sheep, birds, deer, and goats. Permanent shelters are in place to protect animals from inclement weather. Predators are a concern for sheep and newborn calves, and predator control measures have been implemented, including use of biological control (ex: a llama, donkeys). Deer are contained within a high fence enclosure on grass. Horses, sheep, goats, cattle and outdoor pigs are housed in barns, dry lots, corrals and pastures.

ii. Describe methods used to protect animals from weather extremes, predators, and escape (windbreaks, shelters, shaded areas, areas with forced ventilation, heat radiating structures, access to conditioned spaces, etc.).

Flood Plans (move animals to indoor facilities or pasture land); Windbreaks (hills, two- or three-sided structures, barns), shelters (two or three-sided structures, barns), or shaded areas (trees, two- or three-sided structures, shade cloth, barns); areas with forced ventilation (barns with fans); heat-radiating structures (barns with heaters); and access to conditioned spaces are provided to protect animals from extreme weather conditions. Additionally, horses are brought into closed barns in advance of forecasted extreme weather conditions. A llama is used as predator control for sheep and donkeys for newborn calves when needed. Electric fencing and buried metal guards surround quail pens to repel predators and prevent escape. Deer are enclosed in high fencing in order to maintain predator control, as well as dog proofing the facility with a 1.5 ft of wire mesh fencing that is attached to the bottom of the fence and buried beneath the ground.

Horses- pasture with shade, dry lots with shade, stall barns; Geriatric horses may be blanketed in cold weather
Cattle- dry lots with shade cloth and hills, sprinklers; Pasture. Biological predator control for newborn calves (donkeys)
Pigs- dry lot with hut and wallow, barns with forced ventilation; perimeter fence surrounding barns
Sheep and Goats- open air, covered barns; dry lot with shade, biological predator control (llama), and straw may be provided in outdoor huts. Enclosed pen with top (Rodeo goats).
Quail- enclosed flight pen with vegetation. Perimeter fencing
Deer- high fence enclosure with shade and high grass and shelters

iii. Describe protective or escape mechanisms for submissive animals, how access to food and water is assured, provisions for enrichment, and efforts to

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group compatible animals.

Aggressive animals are separated, and compatible animals of similar size and health status are housed together. Animals are monitored daily to ensure compatibility and sufficient access to food and water. Sufficient feed bunk space, waterers and shelter is provided to allow submissive animals to escape the dominant animals. Horse body condition scores (BCS) are recorded biannually and weighed in January to ensure horses are maintaining body weight, thus have adequate access to food and water. Horses with low BCS (hard to maintain) or require a special diet are fed separately.

f. Naturalistic Environments [*Guide*, p. 55]

i. Describe types of naturalistic environments (forests, islands) and how animals are monitored for animal well-being (e.g., overall health, protection from predation).

When possible, animals are provided naturalistic environments. Many grazing animals, including horses, sheep, deer, and cattle are housed on pasture lands when possible and grass is available. Outside source swine are in grass pens. Some quail (Erskine) are provided a naturalistic habitat to the extent possible such that animal care staff can adequately monitor food, fresh water, and health. Some reptiles and amphibians are provided naturalistic environments dependent upon life stage requirements (aqueous vs. terrestrial) and protocol needs.

ii. Describe how food, water, and shelter are provided.

Animals maintained in naturalistic environments are monitored daily by animal care staff or investigators to ensure adequate access to food and fresh water. Cattle are only put on pastures when ample grasses are available, and may still be grain fed. Many pastures and enclosures have protective shelters or trees. All animals are provided ad libitum water and feed via hand feeding, feeders, pans, or broadcast throughout the naturalistic environment.

iii. Describe how animals are captured.

Animal capture varies according to the species. Livestock natural herding behaviors are used to capture by rounding up, coercing into loading areas, and managing feeding behaviors. Birds, reptiles, and amphibians are captured by nets or hand. Deer are corralled into the handling area.

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C. Animal Facility Management

1. Husbandry

a. Food [*Guide*, pp. 65-67]

i. List type and source of food stuffs.

Rodents: Purina LabDiet PicoLab 5V5R extruded Maintenance Diet; Purina LabDiet PicoLab 5V5R meal Maintenance Diet (Used for soft chow for ill, injured or newly weaned mice); Purina LabDiet PicoLab 5V5M extruded Breeder Diet; Special formulations dependent on experimental design

AFS Dogs: Science Diet Healthy Maintenance; **New Deal dog colony**: Natural Balance Limited Ingredient or Science Diet Chicken & Rice.

Cats: Science Diet Healthy Maintenance

Fish: Zebra fish are fed TetraMin® Tropical Flakes and Bio-Pure® frozen brine shrimp. Larval shiners are fed Rio Grande Silvery Minnow flake food, which is specially made for young minnows by contract with Dexter National Fish Hatchery, Dexter, New Mexico. The hatchery provides 2 kg of this food to us each year to support our research. Adult shiners are fed freeze dried brine shrimp, freeze dried bloodworms and, on occasion, commercially prepared fish food.

Xenopus: Frog brittle or Xenopus Express Floating frog food

Quail: Purina Mills Game Bird Starter, Maintenance and Breeder

Lizards: Insects, fresh and frozen vegetables

Toads/Frogs: Crickets and mealworms

Rabbits: Envigo 2030 Teklad Global Rabbit Diet

Swine, Cattle, Sheep/Goats/Llama: Manufactured from our on-site mill

Outside Sourced Swine: Feed is purchased from a vendor or manufactured from the New Deal Feed Mill

Horses: Manufactured feed from a local feed store

Snakes: Freshly killed or thawed laboratory grade rodents (non-transgenic)

Deer: Forage, hay, grain, vitamins and minerals; feed is purchased from a vendor (Purina)

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Ferrets: Envigo 2072 Teklad Global Ferret Diet

ii. Describe feed storage facilities, noting temperature, relative humidity, and vermin control measures, and container (e.g., bag) handling practices, for each of the following:

- vendors (if more than one source, describe each)
- centralized or bulk food storage facilities if applicable
- animal facility or vivarium feed storage rooms
- storage containers within animal holding rooms

ESB I, II, HSB, BSB, AFS: Feed storage rooms are maintained at or below 70°F.

ESB I & II facility: Purina LabDiet PicoLab diets are supplied to Texas Tech University by Lab Supply through a monthly delivery service. The manufacturing mill date is provided on each bag of feed. Expiration dates are 9 months past the manufacturing date per manufacturer's recommendations. All feed is stored in a temperature controlled, dedicated feed/bedding room within the animal facility (08E & 006). The diets are stored on raised pallets 6-12 inches off the wall. Bags of feed are on a rotational schedule to ensure that older feed is utilized first. The opened diets are stored in NSF and FDA compliant plastic containers. The expiration date of each opened bag is noted on the lid of the containers. Specialized diet formulations are stored in a freezer in the animal facility. Insect sticky traps are used for vermin control and contracted pest control services sprays the perimeter of each building.

HSB facility: Purina LabDiet PicoLab diets are supplied to Texas Tech University by Lab Supply through a monthly delivery service. The manufacturing mill date is provided on each bag of feed. Expiration dates are 9 months past the manufacturing date per manufacturer's recommendations. All feed is stored in a temperature controlled, dedicated feed/bedding room within the animal facility (09). The diets are stored on raised pallets 6-12 inches off the wall. Bags of feed are on a rotational schedule to ensure that older feed is utilized first. The opened diets are stored in NSF and FDA compliant plastic containers. The expiration date of each opened bag is noted on the lid of the containers. Specialized diet formulations are stored in a freezer in the animal facility. Insect sticky traps are used for vermin control and contracted pest control services sprays the perimeter of each building.

AFS facility: Dog and cat food is purchased at PetsMart in Lubbock, TX. Chicken food is purchased from local farm supply stores; i.e. Tractor Supply. Pig feed is purchased from the New Deal Feed Mill or a farm supply store. The manufacturing mill date is provided on each bag of feed. Expiration dates are 6 months past the manufacturing date. All feed is stored in a temperature controlled, dedicated feed/bedding area within the animal facility. The diets are stored on raised pallets 6-12 inches off the wall. The opened diets are stored closed plastic containers. The expiration date of each opened bag is noted on the lid of the containers.

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BSB: Purina LabDiet PicoLab diets are supplied to Texas Tech University by Lab Supply through a monthly delivery service. The manufacturing mill date is provided on each bag of feed. Expiration dates are 9 months past the manufacturing date per manufacturer's recommendations. All feed is stored in a temperature controlled, dedicated feed/bedding room within the animal facility (617F). The diets are stored on raised pallets 6-12 inches off the wall. Bags of feed are on a rotational schedule to ensure that older feed is utilized first. The opened diets are stored in NSF and FDA compliant plastic containers. The expiration date of each opened bag is noted on the lid of the containers. Fresh/frozen vegetables are purchased at Wal-Mart in Lubbock, TX and stored in a refrigerator/freezer (617E). Fresh vegetable are used immediately and replaced on a weekly basis. Crickets and meal worms are purchased at Walter's World of Pets in Lubbock, TX. The crickets are kept in glass aquaria with wood shavings; meal worms are stored in a refrigerator (504). Insect sticky traps are used for vermin control and contracted pest control services sprays the perimeter of each building.

New Deal Dog Facility: Dog food is purchased from Amazon as needed so is not stored in bulk. Dog food is stored in airtight pet food vaults and labeled with expiration date. Temperature, humidity and vermin control follows the same procedures and documentation as the animal room.

TIEHH, Erskine Quail: Quail diets are purchased at local Purina distributors and stored in bins temperature controlled room. TIEHH does not keep Quail diet for storage. It is purchased on an as needed basis.

TTEC/TTRC: The majority of the TTEC/TTRC horses are fed alfalfa cubes. Hay Rite delivers as needed and bags are stored on pallets in the hay barn and in the feed shed (TTRC). Horses requiring a special diet may be fed feed purchased from HF&C, Lubbock, TX and stored on pallets 6-12 inches off the wall in a vermin proof storage unit at TTEC or in feed shed at TTRC. Insect sticky traps are used for vermin control and doors to the storage unit remained closed unless feed is being unloaded or loaded. Any open bags of feed are stored in trashcans with lids.

New Deal Farm: Raw ingredients are purchased from vendors and species-specific (cattle, pig, sheep and goats, deer) feed is manufactured at the Burnett Center.

Littlefield Deer Facility: Feed is manufactured and bagged at the Burnett Center. Feed is loaded and hauled to Littlefield and feeders are filled. No feed is stored at the Deer facility.

iii. Describe special food preparation areas, such as feedmills and locations where special diets are formulated, if applicable. Include in the description sanitation and personnel safety practices (noting that respiratory protection is described in Section 2.I.A.2.b. ii. Standard Working Conditions and Baseline Precautions above).

There are two designated food preparation areas for animals housed at Texas Tech University.

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1. A full-service feed mill for feed manufacturing at the New Deal farm.
2. Food prep station for reptiles at BSB with a designated counter in the washroom.

All other diets are prepared and packaged by approved and/or reputable commercial providers. As such, specially designated food preparation areas are not required for the majority of animals at this University.

iv. Describe how food is provided to various species (*ad libitum*, limited amounts, types of feeders).

Rodents: Pellets – feed is provided ad libitum, unless otherwise justified, through wire bar lid feeders. Meal- provided for soft chow in addition to ad libitum feed as needed for ill, injured, recovering or newly weaned mice.

AFS Dogs: meal fed, once a day in a plastic feeder mounted to the kennel or stainless steel dog bowl.

New Deal dog facility: food is provided twice daily in stainless steel dog bowls and the amount is based on body weight and body condition score. Maintenance food is weighed and fed to the dogs to keep consistent quantities. Dogs are weighed weekly and feeding allotments are adjusted weekly based on weight loss/gain and current body condition score.

Cats: ad libitum dry food in stainless steel bowls on the kennel floor

Rabbits: ad libitum pellets in a J-feeder. Alfalfa cubes are offered on cage floor. Fresh Vegetables and treats are offered as enrichment.

Lizards: Fresh or frozen fruits, vegetables or greens prepared daily in dishes. Insects may be hand fed once per week or more.

Leopard frogs: live crickets or large meal worms 3 times a week.

Snakes: Once to twice a month, snakes are offered laboratory grade rats or mice.

Quail and Chickens: Meal or grains - ad libitum feed trough or bowl.

Fish: Pellets - limit fed based on size and age of fish (1.5% to 3% body weight per day). Juveniles may be fed up to 40% of the body weight per day. Zebrafish- fed ad libitum twice daily.

Xenopus: frog brittle or floating frog food (Xenopus Express) fed 2 tsp every Monday, Wednesday and Friday.

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Horses: TTRC: Total Equine grain (twice daily), coastal hay (ad libitum hay bale or twice daily flakes) and Hay Rite alfalfa cubes (once daily) in rubber tubs and individual mangers. TTEC: Hay Rite alfalfa cubes once daily fed in individual mangers and ad libitum grass hay in hay rings. Older or low BCS horses may be fed a senior diet.

Swine: ad libitum or meal fed 1-2 time daily to growing animals in a bulk pig feeder, troughs, or pans. Adult animals are fed a limited diet in a trough or feeder.

Small ruminants: ad libitum to growing animals in a bunk feeder or creep feeder and adult animals are fed a limited diet in a bulk feeder.

Cattle: ad libitum to growing animals in a bunk feeder and adult animals are fed a limited diet in a bunk feeder.

Deer: ad libitum feed is provided in a 500 lb bulk feeder

Ferrets: ad libitum as they should eat small, frequent meals. Food is offered in stainless steel bowls or J-feeders. Treats are occasionally provided as enrichment.

v. Describe special food quality control procedures including procedures for rotating stock, monitoring milling dates, nutritional quality, bio load, chemical contaminants, etc.

Feed bags are rotated at each delivery to ensure the feed with the oldest milling date is used first, outdated feed is discarded. Rodent and dog/cat feed is not stored in bulk. Feed is delivered or purchased on a monthly basis as needed. Feed is used within six months of the milling date, unless the manufacturer indicates a longer shelf life for the product.

Each New Deal livestock unit conducts their own feed analysis. The frequency that the analysis is conducted is based on the number of animals that are present. The analysis could occur from weekly to monthly.

Feed is manufactured, handled, stored and sampled according to "Good Manufacturing Practices" endorsed by the American Feed Manufacturers Association.

b. Drinking Water [*Guide*, pp. 67-68]

i. Describe the water source, treatment or purification process, and how it is provided to the animals (e.g., bowls, bottles with sipper tubes, automatic watering, troughs, ponds, streams).

All water used in "on campus" animal facilities is supplied by the City of Lubbock and is regulated by the state public health department as safe for human consumption. Water quality reports are provided on an annual basis.

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Water bottles with sipper tubes are used for rodents, rabbits, and ferrets. Hydrogel is provided for convalescent animals, rodents that are unable to reach the sipper tube and rodents that are being exported. Water may be autoclaved or acidified for immunocompromised rodents.

Some portions of ESB II are equipped with the Edstrom Automatic Watering system. Water supply is RO and chlorinated.

Stainless steel or plastic bowls are used for dogs and cats. Water is provided ad libitum.

Plastic bowls are used for reptiles and amphibians

Automatic waterers or bowls are used for all on campus swine

Plastic poultry drinkers are provided for all on campus poultry

All water at the New Deal Farm is supplied by two wells that pump up to 50,000 gallons of water into a tank.

Automatic water lixits are used for swine

Automatic water tanks and water troughs are used for cattle, sheep and goats /llama. Water is provided ad libitum.

Water troughs, automatic waterers and plastic buckets are used for horses. Water is provided ad libitum. Water at the Equestrian Center is supplied by a well that pumps to a pressure tank.

Plastic or metal watering founts or troughs are used for birds.

Water troughs are used for deer.

ii. Describe methods of quality control, including monitoring for contaminants.

On campus facilities: Immunocompetent animals are supplied City water. A QC report is sent to the facilities manager on an annual basis.

ESB II: Water supply is chlorinated RO water. Chlorine levels are checked weekly (2-3 ppm).

New Deal Farm: Two public water wells provide water to the facilities. The water mixes with a 12.5% sodium hypochlorite solution before it enters the ground storage tank. The water is monitored weekly for chlorine levels and monthly samples are submitted to the City of Lubbock water department for testing of coliforms. A quarterly report is sent to TCEQ in Austin and records are kept at the New Deal farm.

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TTEC/TTRC: TTU horses drink well water. Water that supplies the large stall barn and arena is tested weekly for chlorine levels and monthly samples are submitted to the City of Lubbock water department for testing of coliforms. A quarterly report is sent to TCEQ in Austin and records are kept in the TTEC office.

Littlefield Deer Facility: Water is provided through a private well system.

iii. If automatic water delivery systems are used, describe how they are maintained and sanitized.

ESB II Edstrom: automatic waterers are flushed daily with 2-3 ppm chlorinated water. After rack sanitation, the system is flushed with approximately 15 ppm chlorinated water.

Swine on campus are on automatic watering systems. Nipple waterers are checked once daily. Pens, including waterers, are sprayed down daily. Pens and waterers are sanitized every two weeks unless otherwise approved by the IACUC as an exception to the Guide. Pens and waterers are disinfected when the animals are removed from the room and before new animals enter the room.

Swine and cattle at the farm are on automatic watering systems. In the swine unit, pens are power washed and sanitized when animals are moved out. Nipple waterers are checked twice daily. At the Burnet Center, water troughs are checked three times daily and scrubbed with a hard bristle brush three times a week or when soiled with manure. The Beef Center cleans waterers weekly with a brush and then flushed.

Some horses at TTEC and TTRC are on automatic waterers. Waterers are checked daily to twice daily by animal caretakers, cleaned weekly and sanitized with bleach monthly.

Erskine quail are on an automatic watering system. Water troughs or bottles are used for quail at TIEHH. Water troughs and drippers are removed for hand washing and sanitation.

c. Bedding and Nesting Materials [*Guide*, pp. 68-69]

i. Describe type(s) and how used for various species.

Rodents: Anderson 1/8" corncob as standard contact bedding with cotton nestlets, autoclaved shredded feed bags, nesting sheets, or Enviro-Dri. Alpha-Dri is also used as additional bedding/nesting material for our breeding colonies.

Chickens: Pine wood shavings

On Campus Swine: Rubber mats and pine wood shavings or raised pens

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Quail: Nest boxes and newspaper; Playground sand for dust baths (Kendall- TIEHH); gravel bird paper

Lizards: Sand

Snakes: Sand, pebbles, wood chips or newspaper

Frogs: Peat Moss, potting soil

Horse Stalls: Shavings, pelleted shavings

Cats: Cat bed; resting board for solid surface

Dogs: Resting board and towel

Outdoor Dairy calves: Straw

Outside Sourced Swine: Straw in huts

Rabbits: Shelving

Ferrets: Anderson ¼" corn cob, tunnels and hammocks provided for resting

ii. Describe bulk bedding storage facilities, if applicable, including vermin control measures.

Bagged bedding is stored on racks off the floor and 6" away from the wall in a designated storage area or room. All bedding in the lab facilities are dispensed from plastic barrels with tight fitting lids. Bedding for horses is stored in a barn until opened and spread onto the floor of the stalls. Straw used for outdoor pigs is stored under a protective awning. Vermin control is provided by a professional pest control firm at all facilities. In addition to professional pest control services, barn cats provide pest control at TTEC, TTU greenhouse and NDF farm facilities.

iii. Describe quality control procedures, including monitoring for contaminants.

Rodents: Lab Supply supplies laboratory analysis of all bedding products which will be available upon request.

d. Miscellaneous Animal Care and Use Equipment

i. Describe motorized vehicles and other equipment (e.g., trailers) used for transporting animals, noting the type and how the cargo compartment is

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environmentally controlled, if applicable.

Farm animals are transported in covered open-air livestock trailers. When a trailer is used to transport swine, individuals are instructed to follow SOP058 Swine Trailer Bio-Security Procedures when cleaning the trailer.

Laboratory animals are transported in University-owned vehicles that are climate controlled and equipped with heaters and air conditioners (SOP030).

- 2002 Chevrolet Astrovan

ii. Describe other animal care related equipment used in the animal care program (specialized equipment for exercise or enrichment, high pressure sprayers, vacuum cleaners, tractors, trailers, spreaders, etc.).

2008 Ford F250 Truck with Bowie Vet box
2002 Chevrolet Astrovan
High-pressure sprayer
Floor scrubbing/buffer machine
Shop vacuum
Flatbed carts
AccuPacer Rodent treadmill
Operant conditioning chambers
Hydraulic squeeze chutes
Service carts, dollies
Weight scales
Tractors
Spray rig
Manure spreader
Grain truck
Room fogger for decontamination
Feed mixing/dispensing wagons/trailers
Portable air conditioning and heating units available in the case of HVAC malfunctions or failures.

e. Sanitation [*Guide*, pp. 69-73]

i. Bedding/Substrate Change

1) Describe frequency of contact and non-contact bedding change for each species and enclosure type (solid-bottom or suspended) or pen.

Species	Enclosure type	Frequency of bedding change

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Rats	Solid-bottom; IVC	Weekly
Mice 3+	Solid-bottom; IVC	Weekly
Mice 1-2	Solid-bottom; IVC	q 2 weeks
Ferrets	Solid-bottom troughs	Weekly
Rabbits	Suspended	Pan liner 2-3 times/week; banks sanitized weekly
AFS Dogs	Suspended, slotted floors	Waste removed daily; kennels sanitized q 2 weeks
AFS Cats	Suspended, slotted floors	Waste removed daily; kennels sanitized q 2 weeks
AFS Chickens	Solid-bottom floor pen	Shavings changed out 3 times/week
Reptiles	Solid-bottom	Newspaper changed out as needed, but a minimum of twice a month.
Venomous snakes	Solid-bottom	Once monthly or as needed
Frogs	Solid-bottom	Cages cleaned out 3 times/week; sanitized once a month
AFS Calves	Suspended, slotted floors	Kennel floors cleaned daily and sanitized q 2 weeks
AFS Pigs	Floor pen- rubber mats and textured floors with pine wood shaving. Raised pens- with plastic coated slats or woven wired. Farrowing crates- textured expanded metal	Floors and pens cleaned daily and sanitized q 2 weeks; floor and pens are sanitized around the sow in farrowing crates when possible.
Stalled horses	Dirt floor with shavings, pelletized bedding	Manure and urine are removed daily. Bedding replaced as needed.
Ruminant Nutrition barn	Solid, concrete floors with rubber mats	Solid waste removed twice daily. Pen is cleaned daily; Sanitized when animals move out

2) Describe any IACUC/OB approved exceptions to frequencies

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3) recommended in the *Guide* or applicable regulations and the criteria used to justify those exceptions.

Venomous snake cages are only changed when the PI and a second qualified person are available.

Protocol 18072-11 Study objective- rodent model of early life stress. The home cage bedding except for 10% and all nesting material is removed. This will occur from postnatal day 2 until day 10 or from day 10-20 (water and food available ad libitum). Maternal nursing behaviors are observed and at the end, they are returned to their home cage with regular bedding, nesting and enrichment materials.

3) Note the location where soiled bedding is removed from the cages/enclosures and where clean bedding is placed into the cages/enclosures.

Soiled rodent bedding is removed either in a biosafety cabinet or transfer station or at a waste dumping station (BioBubble). Clean bedding is placed into cages on the clean side of the facility cagewash either manually or via an automated bedding dispenser (ESB II).

Soiled bedding in horse stalls is removed directly from the stall and discarded to a designated area outside the barn. A compost company removes the bulk waste monthly. Additionally, the soiled bedding for the TTU mascot, pig rooms and the chicken room is removed daily and discarded in a city dumpster.

ii. Cleaning and Disinfection of the Micro- and Macro-Environments
Note: A description of the washing/sanitizing frequency, methods, and equipment used should be included in **Appendix 14** (Cleaning and Disinfection of the Micro- and Macro-Environment) and **Appendix 15** (Facilities and Equipment for Sanitizing Materials).

1) Describe any IACUC/OB approved exceptions to the *Guide* (or applicable regulations) recommended sanitation intervals.

Rodent sentinel cages are an IACUC approved exception for sanitation intervals in which dirty bedding from several cages is placed in sentinel cages in order to detect subclinical rodent pathogens.

Protocol 18032-12: chambers are cleaned and disinfected at the beginning and end of the study. This is a hibernating study and therefore removing animals for sanitization would be detrimental to the bats. Minimal disturbance is necessary for the bats' welfare and survival. Excessive disturbance will cause them to arouse too frequently, burn through their fat stores

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prematurely and could lead to death. Hibernating bats also do not eat, and therefore, do not defecate frequently so cleaning and sanitation is not necessary.

Protocol 18007-01: Farrowing crates will be sanitized at the beginning and end of the lactation period. Pens are cleaned and sprayed down with hot water daily. Surfaces around the sows are sanitized but removing sows for total disinfection would be detrimental to their welfare and could affect milk production, therefore, affecting piglet welfare.

2) Assessing the Effectiveness of Sanitation and Mechanical Washer Function

a) Describe how the effectiveness of sanitation procedures is monitored (e.g., water temperature monitoring, microbiological monitoring, visual inspections).

ACS staff check the cage washers daily to ensure that they are functional. Drainage pans and arm nozzles are checked before use. Water temperature in cage washers is monitored through audible alarms and temperature indicator strips. The indicator strips are kept logged in a notebook found in the washroom. Clean materials removed from the cage wash is visually inspected for cleanliness and Safe Step microbiological surveillance (SOP009) is done on quarterly basis to assess level of cleanliness. All cages and equipment are visually inspected to ensure cleanliness.

Non-ACS facilities are included in the Safe-Step sanitation program. ACS facilities manager coordinates with PI labs to test after caging is sanitized. SOP009

b) Describe preventive maintenance programs for mechanical washers.

Cage washers are on a quarterly preventive-maintenance schedule with a contracted company (Getinge). TTU Physical Plant conducts minor repairs as needed.

f. Conventional Waste Disposal [*Guide*, pp. 73-74]
Describe the handling, storage, method and frequency of disposal, and final disposal location for each of the following:

i. Soiled bedding and refuse.

On-campus facilities: Soiled bedding is removed from primary enclosures into cans with plastic liners. The plastic liners are closed and placed in a dumpster for removal to the Lubbock Sanitary Landfill. Trash is conventionally handled through a commercial refuse operator. BSL-2 bedding is autoclaved before disposal.

Farm Facilities

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Swine Center: Solids are disposed of in a waste pit and composted; liquids are disposed of in a lagoon

Burnett center and Beef center: waste is excavated and moved to a waste pit and a compost company removes the waste. Trash is conventionally handled through a commercial refuse operator.

Equestrian Center: Horses stalls are cleaned daily and soiled bedding is removed to a temporary storage pile located approximately 75 feet west of the large stall barn. A compost company removes the bulk waste weekly. Trash is conventionally handled through a commercial refuse operator.

TTU Mascot: stall is cleaned daily and soiled bedding is removed and is discarded in a city dumpster.

Deer: Pens are rejuvenated (tilled, fertilized, and reseeded) on a 3 year basis.

ii. Animal carcasses.

Animal carcasses are placed in plastic bags and stored in a freezer or refrigerator. As needed, the carcasses are taken to the Lubbock Sanitary Landfill and buried. Farm animal carcasses are composted or sent to be rendered by a commercial company. Deer carcasses are placed in a pit and then burned or they are taken to the Lubbock landfill or New Deal farm compost pit. Infectious carcasses are autoclaved prior to disposal.

g. **Pest Control** [*Guide*, p. 74]

i. Describe the program for monitoring and controlling pests (insects, rodents, predators, etc.). Include a description of:

- monitoring devices and the frequency with which devices are checked
- control agent(s) used and where applied, and
- who oversees the program, monitors devices, and/or applies the agent(s).

TTU campus has a pest control contract (Gafford) which is administered through the TTU Operations Division. Sanitation practices and elimination of breeding areas for pests are the first line of control. No insecticides are used within animal rooms or feed and bedding rooms. Some buildings are sprayed on an on-call service, including Biology, Fisheries and Wildlife, and Animal and Food Sciences. All other buildings are scheduled on a quarterly basis to be sprayed for pests (cockroaches, spiders, etc.). These applications occur around the perimeter of buildings or within the building in non-animal areas. Rodent live traps around the perimeters of the building and are used in rodent rooms only in the event when a mouse is loose and cannot be caught. These traps would be inspected daily. Insect sticky traps are used in halls,

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procedure rooms and feed and bedding rooms. ACS staff monitor for the presence of pests and notify the facilities manager for immediate action. SOP071

If there is an infestation in an unused room, TTU Operations Division will contract an exterminator. At least 48 hours after the pests are cleared, the room will be sanitized. At least 24 hours after sanitation the room can be used. The use of pesticides within an animal facility should be minimized, but when utilized, their use must be documented and coordinated with the animal care services staff and be in compliance with regulations. Research staff will be notified of any pesticide use within a facility. Whenever possible, nontoxic means of pest control should be used.

For animals in outdoor facilities, consideration should be given to eliminating or minimizing the potential risk associated with pests and predators (ie. proper storage of food, etc.). (*Guide* 2011). For farm facilities, a pest control contractor visits the farm once per month to control wild rodents and insects. Live rodent traps are used around the perimeter of barns and buildings. Fly bait is used in areas during fly season. Individuals at the farm check the traps on a daily basis. The barns at TTEC the swine center are equipped with a timed, misting fly system.

At the New Deal Farm and the Equestrian Center, barn cats are also used as an effective means for vermin control.

At the Littlefield Deer Facility predators are kept out of the facility with a wildlife high fence at a minimum of 8 ft made from high tensile 9-gauge woven wire with mesh less than 6” in diameter. An additional 1.5 ft of wire mesh fencing is attached to the bottom and buried beneath the ground as an added measure to dog proof the facility.

ii. Describe the use of natural predators (e.g., barn cats) or guard animals (e.g., dogs, donkeys) used for pest and predator control, if applicable.

Barn cats are utilized at the New Deal Farm, TTEC, and the TTU greenhouse for rodent control. Protocol 19054-06

A guard llama and donkeys are used at the TTU sheep center and beef center for predator control if needed.

iii. Note how animal users are informed of pesticide use and how animal users may opt out of such use in specific areas.

Pesticides are used in animal areas only when necessary and investigators whose animals may be exposed are consulted beforehand.

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h. Weekend and Holiday Animal Care [*Guide*, pp. 74-75]

i. Describe procedures for providing weekend and holiday care. Indicate who (regular animal care staff, students, part-time staff, etc.) provides and oversees care and what procedures are performed.

Routine daily care is provided to all animals on weekends and holidays. Regular staff conducts all required procedures (monitoring, feeding, etc.). This may include part-time or student workers, but all animal care staff are properly trained before they work week-ends or holidays. Typically, procedures performed during a weekend or holiday include animal health checks, any required feedings, needed tasks or any animal treatment.

ii. Indicate qualifications of weekend/holiday staff if not regular staff.

Weekend/holiday staff are the regular, trained animal care staff.

iii. Describe procedures for contacting responsible animal care and/or veterinary personnel in case of an emergency.

Telephone numbers for any personnel needed in an emergency situation (investigator and/or veterinarian) are available in the animal facilities. On the AUP there is a specific question that asks the PI to list the personnel that should be contacted in the event an emergency situation should occur, along with their phone number. The Attending Veterinarian, Clinical Veterinarian, Facilities Manager, and Emergency/On-Call Veterinarian's telephone numbers are available in all animal facilities. ESB I/II, AFS and TIEHH have monitoring systems that alert the building manager in case of emergencies.

2. Population Management [*Guide*, pp. 75-77]

a. Identification
Describe animal identification methods for each species (e.g., microchips, cage/tank cards, collars, leg bands, tattoo, ear tags, brands).

Rodents, Rabbits, Ferrets: Cage cards, ear punches or tags, or tattoos. Most cage cards include the following information: principal investigator, protocol number, species, strain, sex, date received, vendor, animal ID (if applicable).

Cattle: Ear tags and branding (thermal and freeze)

Sheep & Goats: Ear tags

Dogs: Each dog is identified by a cage card. The card identifies the dog with a photo, name, breed and color.

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Cats: Each research designated cat is identified by a cage card and vendor source tattoo. The card identifies the cat with a photo, tattoo # (if applicable), breed and color. Barn cats are identified by photographs which are maintained in records. When cats are spayed or neutered, they are ear notched.

Horses: Each horse is identified with a name and description and has an individual file. ACS maintains pictures of TTEC horses for identification. Some TTEC and TTRC horses are freeze branded with a double T.

Swine: Ear tags or notches and tattoos

Amphibians: Aquarium card, Cage card

Fish: Aquarium card or label

Snakes, Lizards: Aquarium or Cage card

Birds: Cage cards, leg bands, or wing bands

Deer: Ear tags

b. Breeding, Genetics, and Nomenclature

i. Describe the program for advising investigators on the selection of animals based on genetic characteristics.

Investigators seeking laboratory animals with specific genetic characteristics consult with ACS personnel regarding availability and source. The AV or facility manager assists investigators via consultation with commercial vendors or relevant reference materials. Considerations are based on animal purchase costs, commercial availability of animals, per diem rates, number of animals needed, viability and fertility of animals, anticipated duration of the study, and other factors.

ii. Describe the program for advising investigators on using standardized nomenclature to ensure proper reporting of the identification of the research animals with regard to both the strain and substrain or the genetic background of all animals used in a study.

The IACUC is responsible for reviewing each protocol application to ensure that standard nomenclature is used prior to approval of the application, and of informing investigators or any needed corrections. If need be, a TTU veterinarian will consult with the PI regarding appropriate strain/sub-strain. Standard nomenclature is used where available to assure proper identification of animals. Standard nomenclature information is included on cage cards to

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assure accurate identification and appropriate breeding outcomes. Genotyping is performed to ensure appropriate strain and sub-strain of offspring.

iii. Describe genetic management techniques used to assess and maintain genetic variability and authenticity of breeding colonies, including recordkeeping practices (*Guide*, pp. 75-76).

When transgenics are bred, genotyping is conducted on the offspring to determine correct genetics. Records are maintained by the investigators and ACS breeding coordinator.

iv. For newly generated genotypes, describe how animals are monitored to detect phenotypes that may negatively impact health and well-being. Note that the methods used to report unexpected phenotypes to the IACUC/OB should be described in section 2.1.B.1.c.ii, "Unexpected Outcomes that Affect Animal Well-Being."

If investigators request the use of unique genetic strains, they are required to indicate so on protocol applications. If expected or unexpected phenotypes may result in negative impacts on animal well-being, plans for monitoring, handling, and management must be detailed in protocol applications. Investigators are able to consult the veterinary staff for proper monitoring and management of such newly generated strains. In addition to providing consultation and health care, the veterinary staff may also report such cases to the IACUC, when necessary. Animals known to have phenotypes that negatively impact well-being are identified at the cage level and monitored closely; special husbandry or medical provisions are also provided. Genotyping is performed to ensure appropriate strain.

III. Veterinary Care [*Guide*, pp. 105-132]

Note: Complete each section, including, where applicable, procedures performed in farm settings, field studies, aquatic environments, etc.

A. Animal Procurement and Transportation [*Guide*, pp. 106-109; *Ag Guide*, pp. 8; 45; 50-57]

1. Animal Procurement

Describe the method for evaluating the quality of animals supplied to the institution (from commercial vendors, other institutions, etc.).

No animals are acquired or purchased until the IACUC has approved the protocol requesting the use of these animals. Specific requests for acquisition of particular species, breeds, or strains by the investigator are communicated with the veterinarians and processed after protocol approval.

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Vendors are evaluated for species availability and commitment to high standards of animal care and quality. The AV or CV provides investigators guidance when they request the purchase of animals. Investigators that request purchase of animals from sources other than commercial vendors must justify this in their protocol. Non-commercial vendors must supply a health report to the AV before shipment of animals occurs (IACUC Policy 06 and SOP 057). Rodents from non-approved vendors will undergo a quarantine period (IACUC Policy 30).

Rodents, ferrets, and rabbits are purchased through approved vendors.

Livestock may be purchased through a commercial order buyer with a reputation and record of providing quality animals. Livestock may be leased through a private producer or feedlot. Occasionally an investigator will select animals from a producer that has the quality and number of animals needed for a project (IACUC Policies 25 & 28). Livestock (pigs, lambs or cattle) may be purchased from major stock shows (Fort Worth, San Antonio, Houston, Austin) for the purpose of demonstration (judging contests, youth judging camps)

Quail are purchased from a commercial vendor or wild caught.

AFS Dogs and cats are obtained from a USDA inspected facility and then returned to the facility upon completion of the research. Individual health records are requested from the facility when shipment occurs. Health records and USDA disposition forms from our institution accompany the animal back to the original facility.

NDF Dog Colony: dogs are obtained from local shelters. Upon arrival, they receive a physical exam, vaccinations (if needed), 4DX test and are spayed or neutered if needed. After completion of the study, they are returned to the shelter for adoption. Health records and USDA disposition forms from our institution accompany the animal when returned.

Swine at the Swine Center are purchased from a commercial seedstock supplier (PIC USA) that can guarantee the health status of the swine. A veterinary consultation between the AV or CV and the source farm's veterinarian is conducted before the animals are purchased. Incoming gilts undergo a quarantine period of 30 days away from the swine center. They are oral fluids tested upon arrival for PRRS & PEDv (PCR) and are serology tested at 30 days for Brucellosis, Pseudorabies, PRRS and PEDv (Serology). Swine may also be purchased from local suppliers after consultation with the veterinarians and health status approved. These pigs are not housed at the Swine Center.

The outside sourced swine are purchased from Texas Livestock Shows and housed at facilities away from the TTU swine center.

Fish are purchased from commercial vendors and the Texas Parks and Wildlife Commission or wild caught.

Amphibians may be purchased from a commercial vendor (e.g. Xenopus Express, Wards Natural Science, and Carolina Biological).

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Reptiles are acquired from peer Institutions (Oklahoma State University), wild caught or donated.

Deer are donated through Deer Breeders Corporation.

2. Transportation of Animals

Describe how animals are transported between outside sources and the institution and within the institution, including loading, unloading, level of biosecurity, immune status and specific pathogen status (consider all species, including aquatic and semi-aquatic species).

Mice, rats, rabbits, ferrets, cats, dogs, amphibians, reptiles, and birds are transported to Texas Tech University from outside sources performed by the vendor in company climate-controlled vehicles, by approved airlines, or by USDA approved animal transporters. IACUC-approved standard operating procedures on transportation of animals are followed. Rodents, rabbits, and ferrets from commercial vendors must have accompanying health status reports before unloading. Rodents from Non-commercial vendors are placed in quarantine upon arrival (IACUC Policy 06 and SOP 057).

Dogs, cats, ferrets, and rabbits receive a physical exam, are vaccinated if needed, and are treated (if needed) for endo and ectoparasites upon arrival. When dogs are received for the New Deal dog colony, they are received at AFS for physical exam, spay/neuter, vaccinations, parasite control and 4DX testing. The day following surgery they are transported to the New Deal facility.

SOP 030 describes transportation of animals within TTU buildings and between buildings. Animal Care Services should be involved in the planning and execution of animal movement. Proper containment of animals transferred is essential. Animals should be transported in a manner that is escape proof. If animals are transported through areas intended for use by the general public, they must be covered. Plastic bags must never be used to cover cages/containers during transport. If ambient temperature outside is between 45°F and 85°F, then animals may be transported without climate-controlled vehicles. Transporting animals by hand carrying should be limited to travel in a direct and timely manner. If ambient temperature is below 45°F or above 85°F, then they must be transported within climate-controlled vehicles. The vehicle heating/cooling system must maintain the temperature 45°F-85°F.

Some limited number of wild rodents, fish, anurans, and reptiles are transported in tanks or cages in institutionally-owned, climate-controlled vehicles from the field to the facility. IACUC-approved standard operating procedures on transportation of animals are followed.

Livestock and Deer are transported according to Department of Transportation (DOT) guidelines by trucks and trailers. IACUC-approved standard operating procedures on

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transportation of animals are followed. Pigs are placed in quarantine upon arrival for a period of 30 days prior to introduction into the herd. Upon arrival, horses must have a negative Coggin's test.

Animals are transported between university facilities in university trucks, vans and trailers. Animal Care Services has a climate-controlled van dedicated for animal transport. Use of personnel vehicles must be reviewed and approved by the IACUC.

Delivery of animals is coordinated with the vendors and ACS staff to ensure that individuals are present to receive animals.

B. Preventive Medicine

1. Animal Biosecurity [*Guide*, pp. 109-110]

a. Describe methods used to monitor for known or unknown infectious agents. Note that if sentinel animals are used, specific information regarding that program is to be provided below.

Swine (SOP014, Policy 1)
Incoming animals: No incoming animals enter the TTU swine unit except replacement gilts. Gilts are acquired from a known vender (Pig Improvement Company) and a vet-to-vet is done prior to shipment. Upon arrival, gilts are quarantined away from the swine center for 30 days and oral fluids is collected immediately for PCR testing (PRRS, PEDv). After the 30 days, animals are serum tested for Brucellosis, Pseudorabies (PRV), Porcine Epidemic Diarrhea Virus (PEDv) and Porcine Respiratory and Reproductive Syndrome (PRRS). Animals are not moved into the herd until the results come back negative. New animals are vaccinated for Leptospirois, Parvovirus, and Circovirus prior to entering the herd. Biannual Surveillance testing occurs in April and October. A rope is hung in random pens in both finishing and nursery for a period of 30 minutes. Oral fluids are collected and tested for PRRS and PEDv.
Persons entering the unit (Policy 1): Any person entering the swine unit must enter through the South side of the central office building (portable building). Upon entry, shoes and outer clothing (e.g. jackets), watches, loose items like keys and cell phones are removed and stored on the non-farm side of the facility. The individual will then step over the barrier in their socked feet where coveralls and boots are donned. A barrier (solid bench) separates the non-farm side (dirty) from the farm side (clean). Hands are cleaned using soap and water, or hand sanitizer. The process is reversed when leaving the swine unit. Any person who has had contact with pigs in the last 72 hours must enter the Swine Unit via the Northwest doors, marked either men's or women's, and shower into the facility. They will wear farm coveralls and boots and all personal clothing and items, including cell phones, must remain in that building. We recommend that every person shower out to protect their health. Most swine pathogens are not infectious to humans, however, some are zoonotic and showering out can minimize the potential for personal risk. At a minimum, reversing the entry steps (changing footwear and outerwear, washing hands), will be practiced.

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Semen: TTU breeding females are artificially inseminated with PIC genetics semen. When semen from other sources are used, i.e. purebred pigs, it must be tested for diseases as determined by the University Veterinarian, prior to use at an approved veterinary diagnostic laboratory.

Non-swine unit vehicles: Outside vehicles are not permitted at the swine center. Vehicles must park at the central portable building and individuals must enter the swine unit following the appropriate entry system as described in 3a. Only vehicles that have been pre-approved by the swine center manager may enter the perimeter fence.

Equipment and supplies: Equipment and supplies (including research equipment and supplies) that enter the swine unit should either be new and clean, or must be cleaned and disinfected prior to being in the same air space as the pigs.

- No research equipment or supplies that have been used or carried onto any commercial swine facilities will be allowed to be returned to, or used at the New Deal Swine Unit.
- It is recommended that keeping a set of regularly used tools and equipment in the barn permanently will reduce the need to enter and exit the barn more than is required.
- It is recommended keeping disinfectant on the dirty side of the entry to disinfect equipment that will enter the swine unit.

Feed Mill Traffic: The Burnett Center feed mill is the only common source of animal feed production at the New Deal farm, and as such, is a common traffic source for employee, equipment and outside vendor contamination and a potential source of swine disease transmission. Foot traffic as well as vehicle/equipment traffic of swine unit personnel and equipment should therefore be kept to a minimum.

- Consideration should be given to segregating the mill into biosecurity zones, i.e.:
  - inbound ingredients,
  - outbound swine feed,
  - outbound feed to other farm units,
  - and internal mill operations

Swine transportation (SOP058): Biosecurity measures are followed with regards to trailers used to transport swine. To keep newly emerging commercial swine threats to a minimum at the NDSU, strict bio-security measures must be kept, to contain and mitigate any threat of disease outbreaks. All vehicles and items used in the transportation of pigs must be thoroughly cleaned and disinfected.

To help mitigate the possibility of transmission, the trailer should be cleaned in an area that is removed from current resident swine.

1. The trailer(s) should be initially cleaned at an off-sight trailer/truck wash facility, and then disinfected (as described below) once back on sight the NDSU.
2. After initial cleaning outside of the New deal facility, the trailer must be washed and disinfected at the designated area near the Dairy Unit. This area allows access to water as well as electricity for the power washer.

Exterior Cleaning

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1. It is imperative that appropriate PPE such as rubber gloves, rubber boots and eye protection be worn.
2. Use shovels, manure forks, brushes, low-pressure sprayers, or mechanical scrapers to remove all visible organic material from the exterior of the vehicle.
3. Remove any deposits of mud and straw from the wheels, wheel wells, tires, mudguards, and exposed chassis of the trailer.
4. Use detergent and warm water (90ºF–130ºF) to wash the trailer and any removed items.
5. Rinse the trailer with hot water. If that is not possible, allow the vehicle to sit for 5–10 minutes so that the residual rinse water can drip off of the trailer.
6. After cleaning the trailer, use a disinfectant per label directions to kill viruses (Synergize and Virkon S are labeled as PEDV disinfectants).
7. Allow ample wet disinfectant contact time, according to label directions, with the trailer. Rinse off the disinfectant and allow time for the trailer to dry thoroughly.

Interior Cleaning

Note: removal of bedding and initial washing and cleaning must be done outside of the New Deal facility.

1. It is imperative that appropriate PPE such as rubber gloves, rubber boots and eye protection be worn.
2. Remove all non-fixed items from the trailer to be cleaned and disinfected.
3. Use shovels, manure forks, brushes, low-pressure sprayers, or mechanical scrapers to remove all visible organic material.
4. Use detergent and warm water (90ºF–130ºF) to wash all interior surfaces of the trailer
5. Wash the floor mats and all other trailer components that have had contact with pigs with a detergent cleaner.
6. Use a leaf blower to dry pooling water and to get into hard to reach areas for drying
7. After cleaning the trailer, use a disinfectant per label directions to kill viruses (Synergize and Virkon S are labeled as PEDV disinfectants).
8. Allow ample wet disinfectant contact time, according to label directions, with the trailer. Rinse off the disinfectant and allow the trailer to dry thoroughly.

Downtime

1. Heat and lack of moisture are very effective at killing most viruses, therefore downtime will enhance the bio-security associated with chemical disinfection.
2. Allow multiple days (minimum of 48 hours) of downtime prior to any animals being transported in chemically disinfected trailers.

Horses: All TTU horses are Coggin's tested annually for Equine Infectious Anemia. Vaccination schedules for horses include spring boosters of Equine Encephalomyelitis, Tetanus, Equine Influenza, Rhinopneumonitis, Rabies and West Nile which will be administered by IM injections. Pregnant mares will also receive rhinopneumonitis vaccinations at 5, 7 and 9 months of pregnancy by IM injections. A deworming program will be systematically carried out 3-4 times a year according to a rotational regimen. Anthelmintic will be administered as a paste application or oral drench based on body weight. Animals showing clinical signs of illness are either removed from the property or isolated away from

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other animals. Horses will not be permitted on the premises without a negative Coggin's. This includes incoming horses or privately owned horses coming in for events.

Cattle: All cattle are obtained from known or previously approved sources. Incoming animals will have been vaccinated for, or will receive at the time of entry, immunization for bovine respiratory diseases (IBR, PI3, BVD Types I and II, BRSV), a seven-or eight-way bacterin toxoid (*Cl. chauvei,Cl. septicum,Cl. Novyi Type B & D,Cl. sordellii*, and *Cl. perfringens* C & D), *Pasturella* and *Haemophillus*, Leptospirosis (*L. Pomona, L. canicola, L. icterohemorrhagica, L. grippotyphosa, and L. hardjo bovis*), *Campylobacterosis fetus* and will receive an internal and external parasite control product. Non-virgin bulls and bulls >24 months of age which will be used for breeding require PCR testing for *Trichomoniasis foetus* by a veterinarian.

Sheep: Lambs are vaccinated (subcutaneous) for Clostridial diseases and Tetanus (CD&T) at 1 month of age and a booster is given 1 month later. Ewes receive a yearly booster for Clostridial diseases and Tetanus (CD&T) prior to the breeding season. All sheep are dewormed three times per year using an oral drench. Anthelmintics are periodically rotated to prevent causing increased immunity by the parasites.

Mice

Sentinel Program (Policy 06 and SOP057): in place to monitor for infectious agents. Long-term rodents including breeding colonies are in rooms monitored by the Sentinel Animal Program. Two CD-1 female mice 3-5 weeks of age (Charles River) or two CD female rats 4-6 weeks of age (Charles River) are placed per sentinel cage. Sentinel mice/rats are kept for 6-8 weeks before testing and dirty bedding from other cages is placed in the sentinel cages at each change out. In house fur plucks, tape tests and fecal floatations are performed quarterly. Opti-spot samples are sent to IDEXX for serology quarterly. The following tests are routinely performed as part of the ACS panel for health evaluation for mice: Sendai, MHV, MNV, M. pul, PVM, MVM, REO3, LCMV, ECTRO, EDIM, MPV, MAD1 and MAD2. Annually, a more comprehensive evaluation is performed including fur mite and pinworm PCR and Helicobacter PCR.

Animal Receiving:

a. Upon arrival, inspect the shipping crates to be sure that all are in good condition.
b. Take the crates to the quarantine room and take pictures of the crates to document the condition. The packing slips from the crates go to the ACS office.
c. Decontaminate the outside of the shipping container with disinfectant (Clidox).
d. Remove rodents from the shipping container under the Biosafety Cabinet in the quarantine room.
e. Place rodents into prepared cages and cage cards under the Biosafety Cabinet. Carefully match the information from the labels on the crates to the cage cards.
f. Any discrepancy between the information on the crate and the cage card should be reported to the ACS office.
g. Obvious differences between the information and the animal should be reported as well. For example, if black mice are expected and the mice are white, this would be an obvious discrepancy and should be reported.

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h. An accurate count of animals, including a count of dead animals and gel packs or water kits is reported on the daily observation sheet which is located in the quarantine room.
i. Animals are dead on arrival:
    1. Leave dead animals in the crate and notify an ACS veterinarian.
    2. The Vet Tech will photograph the dead animal(s) along with the crate label.
    3. The Vet Tech will discuss with the veterinarian whether or not a necropsy of the animals will be carried out.

Quarantine: (SOP057 and Policy 06)

a. The quarantine room for all incoming rodents attained from "outside" or non-approved vendor sources will be physically isolated from standard rodent housing rooms within the destination vivarium on the main TTU Campus.
b. A dedicated technician will be assigned to the room and daily animal care in this room is performed as the final daily task.
c. Rodents will be observed at least once daily
d. Check to ensure that proper cage to rack connections is maintained daily.
e. Report animals with any clinical signs to the ACS staff or veterinarians.
f. If death occurs, store the carcass in the designated refrigerator and contact an ACS veterinarian immediately for potential post-mortem exam.
g. All rodents are maintained in sterile housing utilizing sterile husbandry techniques as within a typical BSL-2 environment.
h. Disposable PPE (disposable gown, cap, mask, shoe covers and gloves) are worn for each entry and discarded before exiting the room.
i. Gloves are changed between cages.
j. The most recently acquired or the most highly suspect animals within the room are serviced last.
k. Weekend and holiday checks/care are performed as the final task of the day by the assigned duty technician.
l. After entering the quarantine area, husbandry personnel are not permitted to enter any other animal housing area until the next day and must shower during the interval.
m. Quarantine time is approximately 6-8 weeks.
n. Upon completion of quarantine and testing, the PI will be notified and the animals will be transported to their final destination.

Quarantine Animal Testing

a. The quarantine room is surveyed for murine pathogens including MHV, MNV, MVM, MPV, Sendai virus, *M. pulmonis*, Reo-3, PVM, TMEV, pinworms and mites.
    1. Upon arrival into quarantine, a fur pluck test and tape test will be conducted on one animal per cage to screen for mites and pinworms and a fecal pellet will be evaluated for *Helicobacter* sp. by fecal PCR.
b. Sentinel animals are placed in the room and exposed to potential pathogens by exposing them to soiled bedding twice per week from other rodents occupying the room.
c. Rodents are placed on a Fenbendazole diet.
d. Sentinel animal/sera for viral serology and parasite panels will be submitted to IDEXX for analysis at 6-8 weeks. Rodents will not be released to the PI until tests results are completed and an ACS veterinarian clears the animals to enter the colony.

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b. Describe methods used to control, contain, or eliminate infectious agents.

Swine (SOP029 and Policy 01): Designated coveralls and boots are required to enter the swine facility. Personnel or visitors are recommended to shower out when exiting the facility. Traffic is kept to a minimum to prevent organisms from coming into the facility. People that have been in contact with swine within the last 72 hours are required to shower into the facility. At weaning (21-28 days of age), all piglets are vaccinated with *Bordetella, Pasturella, Erysipeles* and Circovirus and boosted 21 days later. Gilts and sows are vaccinated with Swine Influenza and Mycoplasm 2 weeks prior to farrowing, and dewormed 1 week prior to farrowing. At weaning, sows are vaccinated with Parvovirus, *Erysipeles* and *Leptospirosis*. Sows and boars receive Circovirus annually. Additional information is outlined in Policy 1 Biosecurity at the New Deal Swine Unit; SOP058 Swine Trailer Biosecurity Procedures; SOP063 Outside Sourced Swine.

Sheep Center (LOP002): Lambs are vaccinated for Clostridium types C and D and Tetanus at 1 month of age and a booster is given 1 month later. Ewes and rams receive a yearly booster prior to the breeding season.

Beef Center (SOP022): All cows and bulls are re-immunized annually with a modified live vaccine to protect against bovine respiratory disease (IBR, PI3, BVD Types I and II, BSRV), *Pasteurella and Haemophillus somnus,* leptospirosis (*L. pomona, L. canicola, L.icteromhemorrhagica, L. grippotyphosa, and L. borgpetersenii serovar hardjo bovis*) and *Campylobacterosis fetus* prior to breeding according to the manufacturer's directions. Cows and bulls are given an annual booster vaccination against the clostridial diseases (*C. chauvei, C. septicum, C. Novyi Type B & D, C. sordellii, and C. perfringens C & D*) with a seven-or eight-way bacterin toxoid. All calves are to be immunized at approximately three and six months of age with a modified live vaccine to protect against bovine respiratory disease (IBR, PI3, BVD Types I and II, BSRV), *Pasteurella and Haemophillus somnus,* leptospirosis (*L. pomona, L. canicola, L. icteromhemorrhagica, L. grippotyphosa, and L. borgpetersenii serovar hardjo bovis*) and *Campylobacterosis fetus*. In addition, calves are vaccinated and re-vaccinated against the clostridial diseases (*C. chauvei, C. septicum, C. Novyi Type B & D, C. sordellii, and C. perfringens C & D*) with a seven-or eight-way bacterin toxoid.

TTEC/TTRC (LOP002): Vaccination schedules for horses include annual boosters of Eastern and Western Equine Encephalomyelitis, Tetanus, Equine Influenza, Rhinopneumonitis, Rabies and West Nile Virus. Young foals will receive vaccinations (IM) of Eastern and Western Equine Encephalomyelitis, Tetanus, Equine Influenza, Rabies Rhinopneumonitis and West Nile Virus at 4 and 6 months of age. Horses will not be permitted on the premises without a negative Coggins. This includes incoming horses or privately owned horses coming in for events.

ESB & ESB II: Designated scrubs or lab coats are worn in this facility. Agent or room appropriate PPE shall be worn in addition to the scrubs or lab coats. A rodent sentinel program

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is in place for this animal facility. Animal facilities have restricted access. A quarantine protocol is followed if rodents are imported from a non-vendor source.

AFS: Animals are monitored daily for any signs of illness. Dogs and cats are vaccinated upon arrival if needed. Dogs receive Distemper, Hepatitis, Parainfluenza, Parvovirus, Coronavirus and Rabies. Cats receive Feline Viral Rhinotracheitis, Calicivirus, Panleukopenia and Rabies. Animal facility has restricted access.
Barn cats are initially tested for FeLK/FIV and are vaccinated annually.

HSB: Designated scrubs or a lab coat are worn in this facility. Room appropriate PPE shall be worn in addition to the scrubs or lab coats. A sentinel program is in place for this animal facility. Animal facility has restricted access.

BSB: A designated lab coat is worn to check animals or work with animals in this facility. A sentinel program is in place for this animal facility. Animal facility has restricted access.

Deer (SOP059): Deer are dewormed 3 times a year, unless parasite load indicates more or less often. A semi-annual vaccination program is in place for resident deer. This includes clostridial agents (*C. chauvoei, C. septicum, C. haemolyticum, C. novyi, C. tetani* and *C. perfringens* types C and D.

2. Quarantine and Stabilization [*Guide*, pp. 110-111]

a. Describe the initial animal evaluation procedures for each species.

Rodents, rabbits and ferrets are supplied by commercial vendors who have colonies of defined health status. Non-vendor sourced rodents are not accepted unless the veterinary staff has reviewed a health status report and approved the import. Upon arrival, animals from a non-vendor source held in quarantine for 6-8 weeks. All animals received are visually inspected for overt signs of disease by trained staff members. Any problems are reported to the veterinary staff for intervention. Rodents or aquatic species that are determined to be unhealthy are humanely euthanized, and the vendor is contacted to provide replacement animals. Resolution of health problems concerning large animals are concluded after discussions between the veterinary staff and the vendor at the time of delivery.

Rodents, Rabbits and Ferrets: If an animal is suspected of having a condition that may threaten the health status of other animals in the facility, then they may be euthanized. Animals are visually inspected by animal care staff. Sick or injured animals are removed and examined by the veterinary staff.

Cattle and horses: Sick or injured animals are isolated in a designated “sick pen” for treatment or observation. Nursing animals are kept with their dams and are not isolated. Horses will not be permitted on the premises without a negative Coggin’s. This includes incoming horses or privately-owned horses coming in for events.

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Swine: Incoming replacement animals are quarantined at a distance away from the swine center for 30 days. After the 30 days, animals are serum tested for Brucellosis, Pseudorabies (PRV), PEDv and PRRS. Animals are not moved into the herd until the results come back negative. Sick or injured animals are isolated in a designated "sick pen" for treatment or observation.

Sheep: Sick or injured animals are isolated in a designated "sick pen" for treatment or observation.

Quail: When quail are received from outside sources, they are isolated separately from other birds. A vendor's health status is closely examined before birds are purchased. Birds are closely monitored for signs of illness or trauma. Sick or injured animals are isolated in a designated "sick pen" for treatment or observation. If an animal is suspected of having a condition which may threaten the health status of other birds in the facility, they may be euthanized.

Fish: If an animal is suspected of having a condition which may threaten the health status of other fish in the aquarium, they are removed and euthanized.

Amphibians: Xenopus are received from a commercial source and are isolated and observed for signs of illness for 2-3 days before use. Sick or injured animals are isolated in a designated "sick pen" for treatment or observation. If an animal is suspected of having a condition, which may threaten the health status of other frogs/toads in the aquarium, they are removed and euthanized.

AFS Dogs and Cats: Upon arrival, animals are inspected and treated for parasites and receive a physical exam. Dogs and cats will also be vaccinated upon arrival if records are not provided. Dogs receive Distemper, Hepatitis, Parainfluenza, Parvovirus, Coronavirus and Rabies. Cats receive Feline Viral Rhinotracheitis, Calicivirus, Panleukopenia and Rabies.

NDF Dog Colony: Upon arrival, dog receive a physical exam, vaccinations (if needed), 4DX test and are spayed or neuter if needed. Dogs arrive as a group and leave as a group.

Deer: Animals are vaccinated before they are shipped, and then treated after arrival as determined by the veterinarians. Deer are visually inspected upon arrival by the PI and/or veterinarian.

b. Describe quarantine facilities and procedures for each species. For each species, indicate whether these practices are used for purpose-bred animals, random-source animals, or both.

In general, purpose-bred rodents and swine are housed by vendor and known disease status.

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Rodents: All rodents are separated by species and project. Rodents are quarantined and placed in the room where they are to be maintained for the project. Acclimation period is 3 days (minimum). Rodents from commercial vendors that provide sufficient and complete health status data do not require quarantine. Rodents from non-commercial sources still require health status documentation. These animals are quarantined to their own room and will be tested based on standard operating procedures (SOP057) after a period of time. Room quarantine procedures (SOP057) will be adhered to.

Swine: Incoming replacement animals are quarantined at a distance away from the swine center for 30 days. After the 30 days, animals are serum tested for Brucellosis, Pseudorabies (PRV), PEDv and PRRS. Animals are not moved into the herd until the results come back negative. Incoming animals are isolated/quarantined on dirt or concrete pens with a large space barrier from the adjacent swine. A large 3-sided hut and mud wallow may also be provided in each quarantine pen if they are in the dirt lots.

Feedlot cattle: Feeder calves are placed on concrete partially slotted-floor pens or soil-surfaced pens on arrival at the Burnett Center. Conditioning of the feeder calves is 7 to 21 days depending on size and age of animals. During this period, the feeder calves are processed (weighed, identification tag, implanted, immunized and treated with an anthelmintic).

Beef cattle: If required, cattle are isolated/quarantined in pens/pastures with a large space barrier from the adjacent cattle for a minimum of 7 days.

Sheep: Sheep are isolated/quarantined in pens/pastures with a large space barrier from the adjacent sheep for a minimum of 7 days.

Horses: Horses are isolated/quarantined in pens/pastures with a large space barrier from the adjacent horses for a minimum of 7 days.

Dogs/Cats: The source is providing dogs and cats for non-invasive, behavioral research on a lease agreement and they are returned to the facility upon completion for adoption or continued research purposes. Because the animals originate from a common facility and there are no other dogs or cats housed in the TTU facility, a quarantine period is not necessary. The animals are examined upon arrival and acclimated for 5-7 days (minimum). If deemed unhealthy or incompatible, they are returned to the original source. Dogs and cats are not euthanized for study purposes at TTU.

Frogs/Fish: Placed in the facility (aquarium/tank) where the project is to be conducted. Quarantine/conditioning period of four days (minimum).

Quail: Placed in the facility where the project is to be conducted. Quarantine/conditioning period of four days (minimum).

Deer: Animals are quarantined when they arrive at the facility for 30 days.

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c. Describe the required/recommended stabilization period for each species.

All animals are conditioned in the room, pen, or area where the animals are to be maintained during the research project. During this period, animals are fed a diet consistent with the experimental protocols or National Research Council (NRC) requirements. If possible, animals are maintained in constant visual contact with other animals of the same species.

IACUC Policy 08
Rodents, Rabbits, and Ferrets: Rodents are generally acclimated to their new environment for a minimum of 3 days and rabbits/ferrets for 5-7 days before any treatment is applied.

Swine: Nursery pigs are occasionally transported to AFS for a specific project. Pigs are housed in pens with appropriate social interactions and are allowed to acclimate for a minimum of 5-7 days.

Quail: Wild caught or vendor sourced animals acclimate for one week prior to animal experimentation.

Fish: Wild caught or vendor sourced animals acclimate for a minimum of 48 hours prior to animal experimentation.

Dogs and Cats: Animals are generally acclimated to their new environment for a minimum of 5-7 days before any experimental treatment is applied. They are treated for parasites; vaccinated, examined and intact dogs and cats are spayed or neutered.

Livestock species that are mixed for experimentation are generally allowed to acclimate for 48 hours.

3. Separation by Health Status and Species [*Guide*, pp. 111-112]

a. Describe the program for the separation of animals by species, source, and health status. If the animals in different status are not maintained separately, describe circumstances in which mixing occurs and explain the rationale for mixing.

ESB & ESB II: Animal species are maintained separately. No species mixing occurs in this building. Occasionally, mice from different investigators are housed within the same room because their health status and source are the same.

BSB: Non-venomous snakes, and lizards are housed in separate microenvironments, but within the same room. These animals are not under any experimentation and are only used for demonstration and teaching. Different species of amphibians (Xenopus, Leopard frogs) are housed in separate tanks, but may be within the same room.

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AFS: Animal species are maintained separately, but maybe within the same facility. No species mixing occurs within the rooms of this facility. We do not maintain dogs and rabbits concurrently.

HSB: Animal species are maintained separately. No species mixing occurs in this facility.

TIEHH: No species mixing occurs in this facility.

Littlefield Deer: There are only deer species housed at this facility.

NDF: All species of animals are contained within their own units and do not interact nor have contact with other species, with the exception of sheep and goats. A guard llama is housed with the sheep and goats to provide predatory protection. This is a synergistic relationship and causes no ill effects.

TTEC: Horses, cattle, goats are housed separately but may be in close proximity to each other (i.e. Rodeo).

b. Describe situations where multiple species may be housed in the same room, area, or enclosure.

NDF: All species of animals are contained within their own units and do not interact nor have contact with other species, with the exception of sheep and goats. A llama is housed with the sheep and goats to provide predatory protection. This is a synergistic relationship and causes no ill effects. Barn cats may wander throughout the facility, but they typically do not interact with the livestock.

BSB: Non-venomous snakes, and lizards are housed in separate microenvironments but within the same room. These animals are not under any experimentation and are only used for demonstration and teaching. Fish and amphibians are housed in separate tanks, but within the same room.

Deer: All deer species are contained within their own penned area.

Livestock Arena: All species of animals are contained within their own pens. These animals are typically housed in this facility on a short-term basis for events such as livestock judging, rodeos, etc.

TTEC: Horses, cattle, goats are housed separately but may be in close proximity to each other (i.e. Rodeo). Barn cats may wander throughout the facility, but they typically do not interact with livestock.

c. Describe isolation procedures and related facilities for animals.

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Social and/or group-housed animals are not isolated except in instances where animals become ill or as dictated by experimental design. The PI must receive IACUC approval in order for a social animal to be singly housed. Aggressive or ill rodents may be isolated by cage. Dog aggressive dogs or dogs recovering from surgery may be isolated.

C. Clinical Care and Management [*Guide*, pp. 112-115]

1. Surveillance, Diagnosis, Treatment and Control of Disease [*Guide*, pp. 112-113]

a. Describe the procedure(s) for daily observation of animals for illness or abnormal behavior, including:

- the observers' training for this responsibility
- method(s) for reporting observations (written or verbal)
- method(s) for ensuring that reported cases are appropriately managed in a timely manner.

All animals are observed a minimum of once daily. Observations are recorded on the "Daily Observation Record".
On campus facilities: Rodents that are determined to be ill by the animal care staff are carded with a sick card and then examined by the animal health technician. For minor or common ailments, the animal health technician may treat the rodent with standardized treatments. Veterinary staff will examine all other issues and develop a treatment plan. If the animal requires treatment or observation, the cage is carded with a treatment/observation card. All information, including treatments for that animal is recorded electronically in a health record spreadsheet and the PI is notified electronically.

Off-campus facilities: Any abnormal illness or behavior is immediately reported to the Attending Veterinarian, Clinical Veterinarian or their designee via email or phone call. Any diagnostic action, treatment or observation will be communicated verbally and written in the treatment section of the IACUC notebook. Animal caretakers are required to complete a generic training session in order to work with animals at TTU. They should receive species-specific training either from Animal Care Staff, managing staff or their supervisor to understand normal and abnormal behavior, anatomy and physiology of the species they are working with. Documentation of diagnosis, treatment and outcome are added on Clinical Treatment forms or Daily Observation forms for large animal species.

b. Describe methods of communication between the animal care staff and veterinary staff and the researcher(s) regarding ill animals.

ACS staff or the veterinarians will communicate verbally or electronically with the researcher or unit manager. Any communication regarding animal diagnostic action, treatment or observation will also be recorded in the IACUC notebook or electronically in a spreadsheet. These serve as health records.

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The animal care technician or facilities manager will report any abnormal behavior or illness electronically or verbally to the AV/CV and investigator and record observations on the "Daily Observation Record".

On campus facilities: A card system is used to communicate between Animal Care staff, the veterinarians and the researchers. A sick card (white or yellow) is placed on the affected cage signifying the problem by either the animal care staff or research staff. This alerts the vet staff that the animal needs attention. After examination, a plan is formulated and a treatment card (salmon) is placed on the affected cage. The card alerts to the problem/diagnosis and contains a plan (medical treatment, observation, euthanasia). If the research lab needs to take action (collect data or euthanize), then they are immediately contacted by the veterinarian, animal health technician or facilities manager. When the research lab administers a treatment or conducts a procedure on an animal, they card the cage with an experimental card (green). This alerts the animal care and vet staff that something experimental has occurred with those animals. This allows the animal care or vet staff to determine whether an illness or behavior is related to the experiment (i.e. blood in cage after blood collection, lethargic animal following anesthesia). Other cards used to communicate between research staff and animal care staff are dead cards (red), surgery cards (teal), fasting cards (orange), infectious disease cards (hot pink), raising litter (yellow) and tumor burden cards (light blue). Information is recorded in an electronic spreadsheet for rodents including animal outcome.

Off-campus facilities: Unit managers, student workers or research staff alert the veterinarian when an animal needs attention either via email, phone call or text message. Once the veterinary staff examines an animal and formulates a plan, the treatment records in the IACUC notebook are completed indicating that plan. This may include medical treatment (including frequency and duration), observation or euthanasia. Animal outcome is recorded as well. In the case of an after-hours emergency, the ACS veterinarians or emergency/on-call veterinarian is contacted.

The AV is responsible for oversight and authorization of all treatments. A University Veterinarian, in consultation with the investigator, will authorize euthanasia of any animal.

c. Describe the preventive medicine and health management/monitoring programs (e.g., physical examination, TB testing, vaccination, hoof/nail trimming, teeth cleaning/floating, vendor surveillance, use of sentinel animals) for each species.

Mice/Rats: A Sentinel program (SOP057) is in place to monitor for infectious agents at the Human Science, Experimental Sciences, and Biology Facilities. Long-term rodents including breeding colonies are in rooms monitored by the Sentinel Animal Program. Two outbred female mice 3-5 weeks of age (Charles River) are placed per sentinel cage. Sentinel mice are kept for 6-8 weeks before testing**.** Place clean bedding in the box half the amount that's normally filled. The other half is filled with dirty bedding from other boxes in the room. Soiled bedding from each cage on the rack is collected into the sentinel cage and mixed in with the bedding. The composite sample should always include feces and urine (the sentinel cage should never look clean). Handling of sentinel animals (e.g. cage changing, examination, etc.)

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should be performed after care has been provided for all other animals in the room. Quarterly, blood is collected and Optispots are submitted to IDEXX for serology. The following tests are routinely performed as part of the ACS panel for health evaluation for mice: Sendai, MHV, M. pul, PVM, MVM, REO3, LCMV, ECTRO, EDIM, MPV, MAD1, MAD2 and MNV. In house evaluation of fur plucks, tape tests and fecal exams are also performed. Annually, a comprehensive fecal and fur pluck PCR is included to evaluate for Helicobacter sp., fur mites and pinworms.

Ferrets: Will be obtained from a commercial vendor. They are vaccinated at the vendor for Rabies and Distemper. They will be seronegative for influenza and will be tested before purchase. It is important that ferrets remain influenza-free, so human contact is only allowed with the appropriate personal protective equipment and personnel must receive influenza vaccine in order to work with the animals. Ferrets are given a physical exam upon arrival.

Rabbits: Will be obtained from a commercial vendor. Nails are trimmed every 4-6 months or as needed to prevent overgrowth. Rabbits are examined by a veterinarian upon arrival.

Swine: At weaning (21-28 days of age), all piglets at the Swine Center are vaccinated with Bordetella, Pasturella, Erysipeles and Circovirus and boosted 21 days later. Gilts and sows are vaccinated with Swine Influenza and Mycoplasm 2 weeks prior to farrowing. At weaning, sows are vaccinated with Parvovirus, Erysipeles and Leptospirosis. Sows and Boars receive Circovirus annually. Sows are treated orally with an anthelmintic one week prior to farrowing. Other immunizations will be added if recommended by the AV. Young pigs are given an iron dextran injection during processing at 3-5 days of age. Incoming replacement animals are quarantined at a distance away from the swine center for 30 days. Within 48 hours of arrival, animals are tested for PRRS and PEDv via oral fluids PCR testing. After 30 days, animals are serum tested for Brucellosis, Pseudorabies (PRV), PEDv and PRRS. Animals are not moved into the herd until the results come back negative. Incoming gilts are vaccinated for Leptospirois, Parvovirus, and Circovirus prior to entering the herd. Biannual PCR testing (PRRS, PEDv) of oral fluids occurs in April and October.

Horses: Adults are immunized annually for Eastern, Western Encephalitis, Tetanus, Rabies, Influenza, West Nile Virus and Rhinopneumonitis. Anthelmintics are administered on a rotational plan 4 times per year. Young horses are immunized for Eastern, Western Encephalitis, Tetanus, West Nile Virus and Influenza. Anthelmintics are administered on a bi-monthly schedule starting at 6-8 months of age. Hooves are trimmed by a farrier every 6-8 weeks. Teeth are floated by an equine dentist every 6-12 months. All TTU horses are Coggin's tested annually for EIA. Horses are not permitted on the premises without a negative Coggin's.

Feedlot Cattle: Immunized within the first 21 days of arrival for IBR, BVD, PI3, BRSV, Clostridial diseases (7- way) and Leptospirosis (5 serotypes). An anthelmintic is also administered.

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Beef Cattle: Adults are immunized annually for IBR, BVD, PI3, BRSV and Leptospirosis (5 serotypes) and Clostridial diseases (7-way). Animals are treated for external parasites (lice and flies) as needed. Annually adults are treated for Hypoderma sp. Calves are immunized at 3 and 6 months of age for IBR, BVD, PI3, BRSV, Clostridial diseases (7-way) and Leptospirosis (5 serotypes). Heifers are immunized for Brucellosis between 4-10 months of age. All adult cattle are treated twice per year (spring and fall) with an anthelmintic to control internal and external parasites. Bulls which are sold may require PCR testing for *Trichomoniasis foetus.*

Sheep: Adult sheep are immunized annually for *Clostridium perfringens* C&D and Tetanus. Anthelmintics are administered every 6 months. Lambs are immunized at three and six months of age for *Clostridium perfringens* C&D and Tetanus. TTU sheep participate in the Scrapie Flock Certification Program, so all sheep are tagged with a scrapie tag.

Dogs/ Cats: Upon arrival, they are weighed, inspected and treated for parasites and receive a physical exam and fecal exam. Dogs and cats will also be vaccinated upon arrival if needed. Dogs receive Distemper, Hepatitis, Parainfluenza, Parvovirus, Coronavirus and Rabies. Cats receive Feline Viral Rhinotracheitis, Calicivirus, Panleukopenia and Rabies. A 4DX test is performed on incoming dogs and FeLK/FIV test is performed on new barn cats.

Quail: N/A.

Fish: N/A.

Deer: Deer are dewormed 3 times a year, unless parasite load indicates more or less often. A semi-annual vaccination program is in place for resident deer. This includes clostridial agents (*C. chauvoei, C. septicum, C. haemolyticum, C. novyi, C. tetani* and *C. perfringens* types C and D.

2. Emergency Care [*Guide*, p. 114]

a. Describe the procedures to ensure that emergency veterinary care is continuously available for animals during and outside of regular work hours, including access to drugs or other therapeutics and equipment.

Animal care staff and unit managers observe animals at least once daily. An emergency is reported immediately to the ACS veterinarians, or designee and PI in order for timely intervention to occur. ACS staff rotates weekends and holidays to care for and observe animals. Unit staff also observes and cares for animals during holidays and weekends. Emergency numbers are posted at each facility. There are several approved local emergency vets for large animal emergencies. The University veterinarians are on call at all times, including weekends and holidays and have access to all equipment and drugs.

b. Describe the authority of the Attending Veterinarian or his/her designee relative to the emergency treatment of animals in the program.

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Telephone numbers for any personnel needed in an emergency situation (investigator and/or veterinarian) are available in the all of the animal facilities. The AV, Clinical Veterinarian, Emergency/On-Call Veterinarian's, and Facilities Manager telephone numbers are available in the animal facilities. If at all possible, the veterinarian or veterinarian's designee will consult with the investigator on animal condition and prognosis and provide recommendations for treatment, removal from experiment or euthanasia. If the investigator is not available or unable to agree on the outcome, the veterinarian has final authority to treat the animal accordingly, remove the animal from the experiment or euthanize an animal if necessary.

3. Clinical Record Keeping [*Guide*, p. 115]

a. Describe the procedure for maintaining medical records and documenting treatment of ill animals including: clinical laboratory findings, diagnoses, treatments, medical progress records, etc. Identify the species for which individual records are maintained and where such records are kept.

Dogs, cats, rabbits, ferrets, and horses: animals are observed at least daily and this is recorded on the daily observation form at the unit the animal resides. For these species, individual health records are maintained by the research and animal care staff that include diagnosis, treatment, and outcome.

Mice/Rats: animals are observed at least daily and this is recorded on the daily observation form outside of the room that the animal resides. Rodents that require veterinary examination are carded with a sick card (yellow) to alert the veterinarian to examine the animal. If the animal requires treatment, then the cage is carded with a treatment card (salmon). The animal and treatment are recorded electronically in the Health Records spreadsheet.

Bats: animals are observed at least daily and this is recorded on the daily observation from outside of the room that the animal resides. Any illness will be documented on the daily observation or treatment form followed up with the bat's outcome.

Cattle, sheep/goats, pigs: animals are observed at least daily. Herd records are maintained on livestock, but when individual animals are treated, they are identified and treatment and outcome is recorded on a treatment form. Records are generally kept in the unit manager's office.

Quail: animals are observed at least daily and this is recorded on the daily observation form inside or outside of the room that the animal resides. Colony records are maintained on quail, but when individual animals are treated, they are identified and treatment and outcome is recorded on a treatment form.

Fish and Amphibians: animals are observed at least daily and this is recorded on the daily observation form inside or outside of the room that the animal resides. If an individual animal is treated then treatment and outcome are recorded in the IACUC notebook.

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Deer: animals are observed at least daily. Herd records are maintained on deer, but when individual animals are treated, they are individually identified and treatment and outcome is recorded on a treatment form. Records are kept in the supply room in the deer barn.

The records are readily available to ACS Staff and IACUC for inspection and input. At the end of the study, contents of notebooks are kept in a file in the facility manager's office for three years.

b. Identify individual(s) (titles, not necessarily names) responsible for maintaining such records and identify where the records are maintained and who, including the IACUC/OB has access to the records.

On-campus facilities: ACS animal technicians, including the animal health technician are responsible for conducting daily health checks and recording daily observations and census. TTU vet staff is responsible for recording any clinical illness, including observations, treatment and outcome in the treatment record (except mice and rats). Mice and rats use the card system, which is recorded electronically in the database. Individual health records are maintained on dogs, cats, ferrets, pigs and rabbits. Any preventative or clinical care is recorded including outcome. Records stay outside of the animal room but in close proximity to the animal, then inputted into a Health Record database. ACS staff, vet staff, research staff and the IACUC has access to animal health records.

Off-campus facilities: Unit managers or research staff are responsible for conducting daily health checks and recording daily observations and census. TTU vet staff communicates with the unit managers on recording any clinical illness, including observations, treatment and outcome in the treatment record (except mice). Mice use the card system, which is recorded electronically in the database. Individual health records are maintained on dogs and horses. Any preventative or clinical care is recorded including outcome. Herd records are maintained on cattle, sheep/goats, pigs, horses, quail and deer, but when individual animals are treated, they are identified and treatment and outcome is recorded on a treatment form. Records are generally kept in the unit manager's office. Quail records are kept in the animal room. ACS staff, vet staff, research staff and the IACUC has access to animal health records.

c. Describe the role of the Attending Veterinarian in recordkeeping.

The AV is ultimately responsible for ensuring appropriate veterinary treatment for all animals at TTU and documentation of such treatment. The AV has access to all records for teaching and research animals both on and off campus. The AV reviews records during monthly rounds, semi-annual inspections and as needed.

4. Diagnostic Resources. Describe available diagnostic methods used in the program including:

a. In-house diagnostic laboratory capabilities.

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IDEXX 4DX or FIV/FELV snap tests, fecal floatation, ear cytology, fur plucks, tape tests

b. Commercially provided diagnostic laboratory services.

Texas Veterinary Medical Diagnostic Laboratory (TVMDL)- Coggins, any other diagnostics
Iowa State University Veterinary Diagnostic Laboratory (ISUVDL)- swine diagnostics
IDEXX BioAnalytics- diagnostic service for our sentinel program
Minnesota Veterinary Diagnostic Laboratory-equine metabolic diagnostics

c. Necropsy facilities and histopathology capabilities.

Gross necropsy and sample collection is performed usually on-farm in the case of large animals. For lab animals, a designated procedural space in the animal facility is utilized.

Any histopathology samples are sent to TVMDL, IDEXX or ISUVDL for evaluation.

d. Radiology and other imaging capabilities.

Local veterinarians
Functional MRI is used strictly for research purposes and not diagnostics.
A small animal MRI unit In the Human Sciences Building may be used for tumor detection and/or body composition.
Ultrasound is used by researchers for pregnancy detection in large animal species.
IVIS CT Spectrum is used strictly for research purposes
iDXA scanner is used for research purposes only

5. Drug Storage and Control

a. Describe the purchase and storage of controlled and non-controlled drugs.

Controlled drugs are maintained in a secure, locked safe in the ACS Facilities Manager's office. The ACS Director/AV holds the Drug Enforcement Agency (DEA) license for in-house use of controlled substances. Drug inventory is maintained by the AV and the facilities manager. PI's that use controlled drugs in research must obtain their own research DEA registration and order and maintain their own secured, locked safe. Controlled drugs are not dispensed from ACS to researchers. If controlled drugs are required by a PI for a single purpose or only periodically, then the AV or AV's designee will administer the drug.

Each unit maintains storage of their non-controlled drugs in cabinets and refrigerators. Out-of-date, expired drugs are collected from animal facilities during rounds and discarded appropriately. Investigators and unit superintendents are responsible for maintaining drug

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supplies in their area. All personnel are instructed to check the expiration date of all products prior to using.

Expiration dates are checked during the semi-annual IACUC facility inspection and during monthly veterinary, PAM, and manager rounds.

b. Describe record keeping procedures for controlled substances.

The AV maintains a Drug Enforcement Agency (DEA) license and orders schedule drugs and maintains stock supplies. In most instances, the veterinarian or facilities manager will be present to administer controlled substances. Investigators who use controlled substances for research purposes obtain their own individual DEA license. Inventory log sheets are kept on controlled substances. The log sheets contain how much of each controlled substance was acquired, date when acquired, drug schedule, expiration date, how much is used each time it's administered, who/what it was used for, amount of drug remaining and who administered the drug. Schedule II drug records are kept separate from Schedule IV-III drug records. Record keeping procedures are in compliance with the federal DEA, the Texas Department of Public Safety requirements and the Texas Board of Veterinary Medical Examiners (TBVME). Records must be kept for at least five years in accordance with TBVME. Records are subject to audit by the federal DEA and are reviewed internally by the IACUC during semiannual inspections.

D. Surgery [*Guide*, pp. 115-123]

1. Pre-Surgical Planning [*Guide*, p. 116]

Describe the process(es) used to ensure adequate pre-surgical planning, including: identifying personnel; locating equipment, supplies, veterinary involvement for selecting analgesic and anesthetic agents and facilities; planning; and pre- and post-operative care.

The AV and/or Clinical Veterinarian and the investigator discuss the specific requirements of the surgical procedure. The surgical procedure is described in detail on the "Animal Use Protocol" and must be approved by the IACUC. The individuals performing the surgery and preoperative, intraoperative and post-operative care is described on the "Animal Use Protocol".

The investigator or facilities manager maintains all surgical records for review by the AV, Clinical Veterinarian, and the IACUC.

All individuals performing surgery must have training and verify their qualifications on the "Animal Use Protocol". If a surgical procedure is proposed that the AV/CV and/or the investigator are not qualified to perform, then training is sought from outside the institution. In most cases, ACS staff and vets assist in providing anesthesia, surgical and post-operative support for research protocols involving surgery.

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2. **Surgical Facilities** [*Guide*, pp. 116-117, 144-145]
List building name(s) and room number(s) or other locations (coded, if confidential) where surgical procedures are performed. For each, describe:
    - the type of species (including rodents, fish, agricultural species, etc.)
    - nature of procedure(s) (major/minor/emergency, survival and non-survival, etc.)
    - the amount of use [heavy (daily), moderate (weekly), or light]
    - major surgical support equipment available (gas anesthesia machines, respirators, surgical lights, etc.)
    - facilities for aseptic surgery, surgical support, animal preparation, surgeon's scrub, operating room, and postoperative recovery
    - construction features of the operating room(s), including interior surfaces, ventilation, lighting, and fixed equipment used to support surgical procedures and other means of enhancing contamination control

Note: If preferred, the information requested in this section may be provided in Table.

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3. **Surgical Procedures** [*Guide*, pp. 117-118]

   a. Describe the criteria used to differentiate major from minor survival surgery, including classification for certain procedures (e.g., laparoscopic technique).

Major surgery is defined as any surgical procedure that penetrates and exposes a body cavity or any procedure that produces permanent impairment of physical or physiological functions. Minor procedures would encompass all other surgical procedures performed at the TTU.

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[redacted]: Peripheral vessel cannulation of pigs (minor); Ovariohysterectomy (major)/neuter (minor) of barn cats and dogs; Intrathoracic telemetry device placement in calves (major)- PI no longer at TTU

Cattle: Rumen Cannulation (major)

Equine: Clinical surgery may be performed by other veterinary specialist at a fully equipped equine surgical facility for clinical purposes only. The University has no research or teaching protocols that involve equine surgery. Laceration repair is typically the only surgical procedure conducted on horses at TTU.

• ***NOTE***: Castration of cattle, swine, and sheep is not considered a major procedure. Animal care personnel at the individual units are responsible for routine castration, dehorning, tail docking and clipping needle teeth. A veterinarian performs horse castration and cosmetic dehorns as needed. The Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching (2010) recommendations are followed in these procedures.

Bats: tooth extraction (minor)
Amphibians: Hypophysectomy and tract tracing procedures with injections into the tectum and pretectum. Eye ablation (major)

Mice/Rats: Osmotic pump implantation (major or minor); stereotaxic surgery (major), jugular and arterial catheters (minor)

b. How is non-survival surgery defined?

A procedure is classified as a "non-survival procedure" if performed while the animal is under general anesthesia but the animal is euthanized prior to recovery from the anesthesia. The major consideration during non-survival procedures is the animal must be maintained in a surgical plane of anesthesia until it is euthanized. Clean, but not sterile, technique is required for all non-survival surgeries.

4. **Aseptic Technique** [*Guide*, pp. 118-119]

a. Describe procedures, equipment, and protective clothing used for aseptic surgery. Include patient and surgeon preparation.

Aseptic technique reduces microbial contamination to the lowest practical level and it requires everyone involved in the surgery to cooperate in this effort. Surgical suites are thoroughly cleaned and disinfected prior to aseptic surgical procedures and/or on a regular basis as needed. Individuals performing procedures in the Animal and Food Sciences dedicated surgical facility must wear sterilized gowns, gloves, masks and caps during all procedures.

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Individuals performing surgery are required to perform a surgical scrub of the hands and to the elbows for at least three minutes. Animals are prepared for surgery by clipping, shaving and disinfecting the area. Routine preparation includes alternating three Betadine or Chlorhexidine and alcohol scrubs, which start at the center and extend to the outside. Sterile surgical drapes and sterile instruments packs are used to assure sterile technique. For rodent surgeries, clean lab coats or scrubs are used, sterile gloves and masks are worn. Sterile instruments should be used, and the area shaved and disinfected. A glass bead sterilizer may be used for subsequent rodents.

b. Describe methods used to sterilize instruments and protective clothing, including a description of approved liquid sterilants and instrument exposure time(s) required for each, if applicable.

All equipment used in survival surgical procedures is steam autoclaved. Disposable mask, caps, sterile gowns, and sterile gloves are used in dedicated surgical suites or procedure areas.

The squeeze chute used in cattle surgery is sanitized with a disinfectant prior to use. Sterile surgery packs are used for surgery. Single use sterile surgical gloves are used. Surgeries performed in an agricultural setting still require appropriate aseptic techniques, sedatives, analgesics, and anesthetics.

Amphibian surgeries: Instruments are disinfected between animals with an approved disinfectant or glass bead sterilizer. A clean lab coat or scrubs are worn.

Rodent surgeries: Instruments are sterilized in an autoclave initially then may be disinfected between animals with a glass bead sterilizer. A clean lab coat and sterile gloves are worn.

Cold sterilization (Chlorhexidene) is occasionally utilized in field surgeries, such as rumen cannulation or wildlife studies. Alcohol alone is not an effective sterilant.

c. Describe methods for instrument re-sterilization between serial surgeries.

If at all possible, the proper number of surgical packs are sterilized for the number of surgical procedures that are to occur for that day.

For serial rodent or frog surgeries, a glass bead sterilizer is utilized to disinfect instruments. A 15 second contact time is typically appropriate but ensuring that the instruments are cooled before handling.

For serial farm animal field surgeries, cold chemical sterilization is occasionally utilized using 0.5% chlorhexidine solution for a 15-20 minute contact time.

d. Indicate how effectiveness of sterilization is monitored.

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Sterilization indicators in packs are used to ensure proper sterilization. Proper temperature, pressure and cycle times are used. A variety of factors can affect the efficiency of an autoclave; therefore, regular testing of autoclaves to ensure sterilization conditions for temperature, time, and pressure are reached is crucial to insure sterilization and regulatory compliance. Animal Care Services Staff, in conjunction with Environmental Health and Safety, perform weekly biological testing to ensure that all equipment is working properly in accordance with the Environmental Health and Safety Standard Operating Procedure for Periodic Autoclave Testing and Reporting.

For cold chemical and glass bead sterilization, the appropriate chemical, concentration and contact/immersion time is used.

e. Describe surgical support functions provided by the program to investigators.

Surgical support begins during the protocol review process. The ACS vet staff assists in a collaborative effort with the PI to ensure appropriate anesthesia, analgesia and surgical experience.

Surgical support is provided by ACS veterinary staff. These staff members are knowledgeable in aseptic surgical techniques, anesthesia/analgesia, and non-sterile surgical support and are overseen by the AV or Clinical Veterinarian.

AFS Surgical suite: Surgery room, surgeon prep area and animal prep area are separated by physical barriers. The animal prep area has a floor drain and a portable V-trough for preparation of the patient. The surgery room walls are composed of painted cinderblock, which is impervious to moisture. The surgical, anesthesia and physiological monitoring needs of the patient are supported by such major equipment as gas anesthetic machines, and multi-parameter patient monitors. Surgical instruments are steam sterilized in autoclaves located in the Experimental Sciences building and then transported to AFS. Postoperative recovery occurs either in the surgical facility (where surgeons and surgical staff can observe and support recovery) or in their home pens.

5. Intraoperative Monitoring [*Guide*, p. 119]
Describe monitoring and recording requirements for each species, including the type of record(s) maintained. Also note monitoring of anesthesia during non-survival procedures.

AFS Surgical suite: SurgiVet Monitoring equipment (pulse ox, HR, EKG, CO2, rectal temperature, central and peripheral blood pressure). Both Non-survival and survival surgeries performed in AFS are monitored using the SurgiVet Monitor.

Regular assessment of vitals and depth of anesthesia are recorded typically at 10-15 minute intervals for non-rodent species. Rodents are monitored by assessing respiratory patterns and

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response to stimulus.

Regardless of survival or non-survival surgery, non-rodent surgical and anesthetic records are maintained for each surgery performed. Surgery records are kept with the IACUC notebook as well as in the facilities manager's files. Surgical cards (teal) are used for rodent surgery records. Rodent and frog surgical records are maintained by the PI lab group but are available for evaluation.

6. **Postoperative Care** [*Guide*, pp. 119-120]
   Describe the postoperative care program, including who is responsible for overseeing and providing the care, types of records maintained (e.g., perioperative), where the records are maintained, etc.

All post-surgical procedures including individuals responsible for post-surgical care must be described in the Animal Use Protocol and approved by the IACUC. The ACS Veterinarians and the IACUC approve all post-surgical medications and analgesics. Intraoperative and postoperative records are maintained by the facilities manager and/or the investigator's research group. ACS veterinarians, staff and the PI's lab group are responsible for providing postoperative care.

All surgical records are kept by the investigator or the facilities manager and are available for review by the IACUC and the AV.

E. Pain and Distress [*Guide*, pp. 120-121]

1. Describe how and by whom pain and distress are assessed.

The IACUC assigns each protocol to one of four categories of pain and distress, in compliance with USDA regulations. Classifying is according to the level of perceived pain, stress, or distress. A brief description of each category is provided. A full description and examples are available for review (See Policy 02).

Category B (USDA Category B): Animals being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes.
Category C (USDA category C): Projects involving no more than momentary or slight pain or distress with no use of pain-relieving drugs, routine practices and procedures, or no pain or distress.
Category D (USDA category D): Projects involving pain or distress appropriately relieved with anesthetics, analgesics and/or tranquilizer drugs or other methods for relieving pain or distress.
Category E (USDA category E): Projects involving pain or distress that is not relieved with anesthetics, analgesics and/or tranquilizer drugs or other methods for relieving pain or distress.

Research and ACS staff monitor animals at least daily for signs of pain that is either related to the protocol's procedures or spontaneous. ACS staff undergo on the job training in order to

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recognize species-specific abnormalities. Any animals that appear to be experiencing pain are reported to the veterinary staff for evaluation and treatment.

2. Describe training programs for personnel responsible for monitoring animal well-being, including species-specific behavioral manifestations as indicators of pain and distress.

ACS and other animal care staff undergo on the job training to understand normal species-specific behaviors. During training sessions, research personnel are taught about species-specific normal and abnormal behaviors. Animal care staff and researchers will work with experienced staff before they are expected to recognize abnormalities on their own. The AV also conducts lecture style trainings for new animal users (Mouse Biomethodology, Animal Welfare and Ethics).

F. Anesthesia and Analgesia [*Guide*, pp. 121-123]

1. List the agents used for each species.
Note: If preferred, this information may be provided in Table or additional Appendix.

Species	Drug	Dosage	Route
Mice	Isoflurane	1-4% to effect	Inhalation
	Acepromazine	2-5 mg/kg	IP
	Ketamine	100 mg/kg	IP
	Ketamine+ Acepromazine	100 mg/kg	IP
		5 mg/kg	
	Ketamine +	90-120 mg/kg	IP,IM
	Xylazine	10 mg/kg	
	Butorphanol	1-2 mg/kg	SC
	Buprenorphine	.05-.1 mg/kg	SC
	Carprofen	5 mg/kg	SC, PO
	Flunixin meglumine	2.5 mg/kg	SC
	Meloxicam 1-2 mg/kg	1-2 mg/kg	PO, SC
Rats	Isoflurane	1-5% to effect	Inhalation
	Ketamine + Acepromazine	75-80 mg/kg	IP
		2.5 mg/kg	IM

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	Ketamine +	40-80 mg/kg	IP
	Xylazine	5-10 mg/kg	IP
	Telazol	20-40 mg/kg	IP
	Telazol +	20-40 mg/kg	IP
	Xylazine	5-10 mg/kg	IP
	Butorphanol	1-2 mg/kg	SC
	Buprenorphine	.01-.05 mg/kg	SC, IV
	Carprofen	5 mg/kg	SC, PO
	Flunixin meglumine	2.5 mg/kg	SC
Rabbits	Isoflurane	1.5-5% to effect	Inhalation
	Acepromazine	1-5 mg/kg	IM, SC
	Ketamine + Acepromazine	40 mg/kg	IM
		0.5-1 mg/kg	IM
	Ketamine +	30-40 mg/kg	IM
	Xylazine	3-5 mg/kg	IM
	Ketamine +	35 mg/kg	IM
	Xylazine + Acepromazine	5 mg/kg	IM
		0.75 mg/kg	IM
	Ketamine + Acepromazine	40 mg/kg	IM
		0.5-1 mg/kg	IM
	Xylazine	1-3 mg/kg	IM
	Buprenophine	0.01-0.05 mg/kg	SC, IM, IV
	Butorphanol	0.1-0.5 mg/kg	SC, IV
	Carprofen	1-2.2 mg/kg	PO
		4 mg/kg	SC
	Flunixin meglumine	1-2 mg/kg	SC
Swine	Isoflurane	1.5-3% to effect	Inhalation
	Xylazine	0.5-1 mg/kg	IM

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	Acepromazine	1.1-2.2 mg/kg	IV, IM, SC
	Ketamine	11-33 mg/kg	IM, SC
	Xylazine +	20 mg/kg	IM, SC
	Ketamine	2 mg/kg	IM, SC
	Ketamine + Acepromazine	33 mg/kg	IM, SC
		1.1 mg/kg	IM, SC
	Telazol	2-8.8 mg/kg	IM
	Telazol +	4.4 mg/kg	IM
	Ketamine	2.2 mg/kg	IM
	Telazol +	4.4 mg/kg	IM
	Ketamine +	2.2 mg/kg	IM
	Xylazine	2.2 mg/kg	IM
	Telazol +	4.4 mg/kg	IM
	Xylazine	2.2 mg/kg	IM
	Dexmedetomidine	0.04-0.08 mg/kg	IM
	Butorphanol	0.1-0.3 mg/kg	IM, SC
	Buprenorphine	0.01-0.05 mg/kg	IM, SC
	Carprofen	2-3 mg/kg	SC, PO
	Flunixin meglumine	1-4 mg/kg	SC, IM
	Meloxicam	0.4 mg/kg	IM
Cattle	Xylazine	0.05-.15 mg/kg	IV
		0.1-0.33 mg/kg	IM
	Butorphanol	0.05 mg/kg q 6-8 hrs	IV
	Diazepam	0.25 mg/kg	IV
	Ketamine	5 mg/kg	IV
	Lidocaine	Local	SC
	Flunixin meglumine	1.1-1.2 mg/kg	IV, IM
	Aspirin	50-100 mg/kg	PO

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Horses	Acepromazine	0.01-0.05 mg/kg	IV, IM
	Xylazine	1.1 mg/kg 2.2 mg/kg	IV IM
	Xylazine + Butorphanol	0.5-1 mg/kg	IV, IM
		0.02-0.03 mg/kg	IV
	Xylazine +	1 mg/kg	IV
	Ketamine	2 mg/kg	IV
	Xylazine + Butorphanol + Ketamine	1 mg/kg	IV
		0.02-0.04 mg/kg	IV
		2 mg/kg	IV
	Flunixine meglumine	1.1 mg/kg	IV
	Phenylbutazone	4.4-8.8 mg/kg	PO
	Lidocaine	Local	SC
	Firoxocib	0.1 mg/kg	PO
Sheep	Isoflurane	1-2%	Inhalation
	Acepromazine	0.05-0.1 mg/kg	IM
	Xylazine	0.05-0.1 mg/kg	IV
	Xylazine	0.1-0.22 mg/kg	IM
	Xylazine +	0.05-0.1 mg/kg	IV
	Ketamine	2-3 mg/kg	IV
	Diazepam + Ketamine	0.2-0.3 mg/kg	IV
		2-5 mg/kg	IV
	Lidocaine	Local	SC
	Flunixin meglumine	1.1-2.2 mg/kg	IV, IM
	Buprenorphine	0.0005-0.01 mg/kg	IV, IM, SC
	Phenylbutazone		
Reptiles	Ketamine (sedation)	22-44 mg/kg	IM
	Ketamine (surgery)	55-88 mg/kg	IM

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Amphibians	Tricaine Methanesulfonate (MS-222)		
	Tadpoles	200-500 mg/L	Bath to effect
	Xenopus	0.5-2.0 g/L	Bath to effect
	Leopard frogs	100-200 mg/kg	ICe
	Meloxicam	0.2 mg/kg	IP
Fish	Tricaine Methanesulfonate (MS-222)	50-80 mg/L	Bath to effect
	Eugenol (clove oil)	60 mg/L	Bath to effect
Dogs	Isoflurane	1-4% to effect	Inhalation
	Dexdormitor +Ketamine +Butorphanol	250 mcg/m^2	IV
		3 mg/kg	IV
		0.5 mg/kg	IV
	Ketamine	10 mg/kg	IV
	Acepromazine	1 mg/kg	IV
	Carprofen	2.2-4.4 mg/kg	PO
	Buprenorphine	0.005-0.02 mg/kg	IM, SC
	Butorphanol	0.2-1 mg/kg	IM, SC
Cats	Dexdormitor + Ketamine + Butorphanol	40 mcg/kg	IM
		6 mg/kg	IM
		0.5 mg/kg	IM
	Ketamine	22 mg/kg	IM
	Acepromazine	0.11 mg/kg	IM
	Buprenorphine	0.005-0.01 mg/kg	IM, SC
	Butorphanol	0.1-1 mg/kg	IM, SC
Deer	*TKX with Targeted Dose of:*		
	Telazol Ketamine Hydrochloride	2.20 mg/kg	IM

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	Xylazine Hydrochloride	1.76 mg/kg	IM
	DMK with Targeted Dose of:		
	Dexmedetomidine	0.44 mg/kg	IM
	Ketamine Hydrochloride		
		0.04 mg/kg	IM
		2.9 mg/kg	IM
Ferrets	Glycopyrrolate	0.01 mg/kg	IM
KGD	Ketamine	8 mg/kg	IM
	Dexmedetomidine	40 µg.kg	IM
KXA	Atropine	0.05 mg/kg	IM
	Ketamine	25 mg/kg	IM
	Xylazine	2 mg/kg	IM

2. Describe how the veterinarian provides guidance and advice to researchers concerning choice and use of anesthetics, analgesics or other pain moderating methods.

The AV and Clinical Veterinarian are responsible for recommending and approving all anesthetics and/or analgesics. If surgery is involved in the project, investigators must consult with the AV or Clinical Veterinarian before completing the Animal Use Form.

3. Describe the monitoring of the effectiveness of analgesics, including who does the monitoring. Include in the description any non-pharmacologic means used to diminish pain and distress.

Rodents, Rabbits and Ferrets: The individual and /or the assistant performing the surgery monitors the depth of anesthesia using the corneal reflex, toe pinch reflex, heart rate and respiration. Rodents/rabbits are provided with an external heat source while under anesthesia and during recovery. If possible, they are administered an analgesic during the surgical procedure and evaluated twelve hours postoperatively. Animals are monitored for movement, preoccupation with the surgical site, and anorexia and failure to defecate or urinate. All information is recorded on the surgical record. There are no surgical protocols involving rabbits or ferrets.

Dogs/Cats: The individual and /or the assistant performing the surgery monitors the depth of anesthesia using the corneal reflex, toe pinch reflex, heart rate and respiration. An external

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heat source is used intraoperatively and post operatively until the patient is mobile. Pre-emptive analgesia is recommended and encouraged during protocol development. Animals are monitored for movement, preoccupation with the surgical site, and anorexia and failure to defecate or urinate. All information is recorded on the surgical record.

Swine: The individual and /or the assistant performing the surgery will monitor the depth of anesthesia by corneal and pedal reflex, heart rate and respiration. Swine are provided a heat source during surgery and postoperatively. Swine are administered an analgesic perioperative or immediately postoperatively and evaluated twelve hours later. SurgiVet Monitoring equipment (pulse ox, HR, EKG, CO2, rectal temperature, central and peripheral blood pressure) may be used throughout the surgical procedure. Swine are monitored for movement, preoccupation with the surgical site, and anorexia and failure to defecate or urinate. All information is recorded on the surgical record.

Cattle/sheep: Surgery is performed using analgesic, and local anesthetic (2% Lidocaine HCl). The individual performing the surgery will monitor the effectiveness of local anesthesia prior to making the incision. The animals are administered a Non-Steroidal Anti-Inflammatory Drug peri- or post-operatively and evaluated within twelve hours. Animals are monitored for movement, preoccupation with the surgical site, and anorexia and failure to defecate or urinate. All information is recorded on the surgical record.

Deer: Immobilizing agents may be used for injured, fractious or stressed animals.

Animal & Food Sciences Surgical Suite has a SurgiVet monitoring device to evaluate patients while under anesthesia.

Non-pharmacologic methods such as, warming pads, soft bedding, food/water on cage floor, separation from cage mates, and/or additional enrichment are used where applicable to reduce pain/distress.

4. Describe how the veterinarian(s) and the IACUC/OB evaluate the proposed use of neuromuscular blocking agent to ensure the well-being of the animal.

TTU currently has no approved protocols involving neuromuscular blocking agents. The NMB agent would be used in combination with appropriate analgesics and anesthetics. These agents would never be used alone.

5. Describe policies and practices for maintaining and ensuring function of equipment used for anesthesia.

All anesthesia machines are serviced and certified annually. The soda lime is replaced when the color changes even slightly with use. This is dependent with the amount of surgical use, so varies at different times of the year. The scavenging system (activated charcoal canister) is replaced when the canister reaches a certain weight.

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G. **Euthanasia** [*Guide*, pp. 123-124]

1. Describe approved methods of euthanasia, including humane slaughter (for additional guidance, see pertinent AAALAC Reference Resources). Include:
   - consideration of species, age, condition (e.g., gestational period, or neonatal) and
   - location(s) for the conduct of the procedure.

   Note: If preferred, this information may be provided in Table or additional Appendix.

All methods of euthanasia are in accordance with the AVMA Guidelines for the Euthanasia of Animals unless justified and approved by the IACUC. Euthanasia occurs in dedicated procedure room or space away from conspecifics.

Rodents:
Carbon Dioxide (10-30% displacement rate) followed by a physical method such as cervical dislocation, decapitation, thoracotomy, or exsanguination per the AVMA Guidelines for Euthanasia (2013).

Inhalant anesthetic (Isoflurane) overdose followed by a physical method such as cervical dislocation, decapitation or exsanguination.

Cervical dislocation without anesthesia requires scientific justification and approval by IACUC.

Decapitation without anesthesia requires scientific justification and approval by IACUC.

Barbiturate overdose.

Neonatal mice >E14 are decapitated with sharp blades.

Small wild rodents (Field studies):
Cervical dislocation without anesthesia for animals <200 g and requires scientific justification and approval by IACUC.

Inhalant anesthetic (Isoflurane) overdose followed by a physical method such as cervical dislocation, decapitation, thoracotomy or exsanguination.

Rabbits:
Overdose of Isoflurane anesthetic followed by exsanguinations.
Overdose of barbiturate IV.

Amphibians and fish:
Tricaine Methane Sulfate overdose

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Eugenol (clove oil) overdose
Benzocaine overdose
Double pithing under anesthesia
Severing spinal cord without anesthesia would require scientific justification and approval by IACUC

Quail:
Carbon dioxide (10-30% displacement rate) followed by a physical method
Cervical dislocation under anesthesia
Cervical dislocation without anesthesia requires scientific justification and approval by IACUC

Swine:
Carbon Dioxide (10-30% displacement rate) on animals <20 pounds
Overdose of barbiturate
Gunshot to head in larger swine by well trained personnel, requires justification and approval by IACUC

Cattle, sheep, deer:
Overdose of barbiturate
Gunshot by well trained personnel
Captive bolt by well trained personnel (deer, cattle, sheep)

Horse:
Overdose of barbiturate

Ferrets:
Overdose of inhalation isoflurane followed by IV injection of pentobarbital

Humane methods of slaughter (sheep, goats, pigs, cattle, deer):
Under the provisions of the Humane Slaughter Act, animals must be rendered insensible prior to exsanguination. The TTU meats lab utilizes various methods to render animals insensible, including captive bolt stun and electric stun. After stunning, exsanguination occurs to achieve death.

2. Describe policies and practices for maintaining and ensuring function of equipment used for euthanasia.

For chemical methods of euthanasia, no equipment is used. Any expired drugs will be disposed of properly.

CO2 tanks are maintained and supplied by Airgas for animal facilities that require them (ESB, Biology, TIEHH, Human Sciences, AFS, EQF and the Swine Center). Centralized CO2 is provided at ESB II. Flowmeters are present at each CO2 station.

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Gas anesthesia machines are serviced and certified annually.

Guillotine: Visually inspected and cleaned between uses. Usage log maintained for each guillotine and must be sharpened professionally after every 100 uses or a minimum of annually. Infrequent use. Policy 30.

Captive Bolt and Electric Stunner: Safely secured between uses. Captive bolt is cleaned and dried after use. The electric stunner is tested annually to ensure that the voltage and amperage to ensure that adequate power is achieved.

3. Describe the methods used to confirm death of an animal.

In rodents and birds, a secondary physical method of euthanasia is performed to ensure death. Reflexes, such as the corneal reflex or toe pinch are assessed. Auscultation is performed to evaluate the absence of a heartbeat.

IV. Physical Plant [*Guide*, pp. 133-155]

A. Facilities Overview

Provide a brief introduction to the animal housing and use facilities. Note that this overview should augment the information provided in **Appendix 2** (Summary of Animal Housing and Support Sites), which includes area, average daily census, and person responsible for each site. Please use consistent terminology for the buildings/areas/sites described in the Location section of the Appendix. Please do not repeat information, but supplement the descriptions provided elsewhere to assist the reviewers understanding of the interaction between facilities, special housing locations, and separate procedural areas.

TTU animal facilities are located on Main Campus, New Deal Farm (NDF), Texas Tech Equestrian Center (TTEC), Littlefield Deer Facility (LDF), Erskine Quail Facility (EQF), and The Institute of Environmental and Human Health (TIEHH). ACS manages five facilities on-campus (ESB, ESB II, HSB, BSB 6th floor and AFS). The remainder of the animal facilities are Investigator or Departmentally managed (NDF, TTEC, LDF, EQF, COOP, TIEHH,). NDF is located 20 miles north of Lubbock. TTEC is located 15 miles southwest of Lubbock. LDF is located 40 miles northwest of Lubbock. EQF is located 3 mile northwest of TTU. TIEHH is located 10 west of Lubbock. Appendix 2 highlights the details of the facilities and their management structure.

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[redacted]

B. Centralized (Centrally-Managed) Animal Facility(ies)

In this section, describe each centralized or centrally-managed animal housing and use facility. Include in **Appendix 3** the floor plans of each on 8.5" x 11" or A4 paper. Ensure that the drawings are legible and the use of each room is indicated (animal housing, procedure room, clean cage storage, hazardous waste storage, etc.). Note that a separate section for describing "satellite housing areas" is included below.

Separately describe **each** Location or Animal Facility, addressing each of the features outlined below (1-8). A complete description of each must be provided; however, common features among locations or facilities may be indicated as such and do not need to be repeated.

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1. General arrangement of the animal facilities (conventional, clean/dirty corridor, etc.).
2. Physical relationship of the animal facilities to the research laboratories where animals may be used.
3. Types of available animal housing spaces used, such as conventional, barrier, isolation/quarantine, hazard containment (infectious, radioactive, chemical), "animal cubicles" or facilities specifically designed for housing certain species such as ponds, pastures, feedlots, etc.
4. Finishes used throughout the animal facility for floors, walls, ceilings, doors, alleyways, gates, etc. (note any areas that are not easily sanitized and describe how these are maintained).
5. Engineering features (design, layout, special HVAC systems, noting exhaust air treatment, if applicable) used in hazardous agent containment.
6. Security features, such as control of entry, perimeter fences, gates, entryways, cameras, guards; identify and describe exceptions for individual facilities or areas incorporating fewer or additional security features than the general features described.
7. Consideration for facilities with exterior windows, if applicable, including management of environmental conditions (i.e., temperature and photoperiod control) and potential security risks.
8. Storage areas for flammable or hazardous agents and materials (e.g., disinfectants, cage-washing chemicals, pesticides, fuel).

Main Campus
Experimental Sciences Building (ESB)

[redacted]

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[redacted]

Experimental Sciences Building II (ESB II)

[redacted]

Human Sciences Building (HSB)

[redacted]

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[redacted]

Biology 6th floor (BSB)

[redacted]

Biology 504 (PI lab)

[redacted]

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[redacted]

Texas Coop Fisheries (108)

[redacted]

Animal & Food Sciences (AFS)

[redacted]

New Deal Farm

[redacted]

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[redacted]

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[redacted]

Beef Center

[redacted]

Sheep Center

[redacted]

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[redacted]

Burnett Center

[redacted]

Ruminant Metabolism Barn

[redacted]

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Canine Olfaction Lab (Metabolism Building)

[redacted]

Metabolism (closed for animal use)

[redacted]

Texas Tech Equestrian Center

[redacted]

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[redacted]

Tech Therapeutic Riding Center (TTRC)

[redacted]

TTEC

[redacted]

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Erskine Quail Facility (EQF)

[redacted]

The Institute for Environmental & Human Health (TIEHH)

[redacted]

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[redacted]

C. Satellite Animal Housing Facilities

In addition to the Appendices summarizing Heating, Ventilation, and Air-Conditioning (**Appendix 11**) and Lighting Systems (**Appendix 16**), summarize animal housing areas that are not centrally-managed or maintained in (**Appendix 17)**, "Satellite Animal Housing Areas."

1. Describe the criteria used to determine/define a "Satellite Animal Housing Area," which may include remote housing facilities or laboratories temporarily or consistently housing animals.

Policy 21: As defined by federal law, a satellite animal facility is any area holding animals outside the TTU core vivariums. The authority and oversight of these facilities rests with the institution through the IACUC. It is the responsibility of the PI to ensure that all applicable federal, state and University regulations and guidelines for care and use of the animals are carried out. One satellite facility (LDF) is located off campus on privately owned property. The owner has donated the facilities for the use of animal housing for the purpose of deer research. The location and use are approved by the IACUC. The veterinary staff has oversight of animal care and conducts monthly rounds. TTU veterinarians have also been involved in deer research projects with the researcher.

2. Describe the process used by the IACUC/OB to authorize, provide oversight of, and ensure compliance with *Guide* standards for the housing of animals outside of centrally-maintained facilities. Include a description of Attending Veterinarian access and physical security.

The satellite animal housing facilities are incorporated in the animal program so they are reviewed no differently than centralized, on-campus facilities. They are inspected and reviewed by the IACUC every 6 months. Investigator and department-managed facilities are expected to care for animals following the same guideline and documentation as ACS managed facilities. The AV and CV have access to all animals both on and off campus.

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D. Emergency Power and Life Support Systems

Note: Complete a Heating, Ventilation, and Air-Conditioning (HVAC) Summary (**Appendix 11**) and Lighting Summary (**Appendix 16**) for each Location described in the Summary of Animal Housing and Support Sites (**Appendix 2**).

1. Power [*Guide*, p. 141]

For each Location, Centralized Animal Facility, and Satellite Housing Facility, provide a brief description of the following:

- Availability of emergency power and if so, what electrical services and equipment are maintained in the event the primary power source fails.
- History of power failures, noting frequency, duration, and, if emergency power was not available, steps taken to ensure the comfort and well-being of the animals present and the temperature extremes reached in animal rooms during the failure.

On Campus Facilities:

[redacted]

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[redacted]

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Malfunctions

No known power outages in this facility; Outdoor facility

2. **Other System Malfunctions.** If not previously reported, describe animal losses or health problems resulting from power, HVAC, or other life support system (e.g., individually ventilated cages) failures, and mechanisms for reporting such incidences. AAALAC International Rules of Accreditation (Section 2.f).

Protocol 16017-03: On February 9, 2017 chickens arrived at the Animal and Food Sciences building in poor condition (5 dead upon arrival). The HVAC system for the room the chickens were housed in was incapable of creating and maintaining the high temperatures chicks require, therefore heat lamps and space heaters were placed in the room to provide supplemental heat for the chicks. Overnight, the space heaters tripped a breaker and 10 chicks were found dead the next morning. After evaluation by physical plant it was determined that the room had a regulator for a maximum room temperature of 75°F. The supplemental heat sources provided caused the room to exceed 75°F. When this happened the facility automatically kicked on the AC to try and maintain the room at 75°F. Shortly after this incident occurred, Physical Plant increased the temperature threshold of the room to 90°F. The incident was reported to the IACUC at the February meeting. As a result, SOP074 Supplemental Temperature Control in On-Campus Facilities was implemented.

E. Other Facilities [*Guide*, pp. 144, 150]

1. **Other Animal Use Facilities** [*Guide*, pp. 146-150]
   Describe other facilities such as imaging, irradiation, and core/shared behavioral laboratories or rooms. Include a description of decontamination and methods for preventing cross-contamination in multi-species facilities.

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[redacted]

2. Other Animal Program Support Facilities

Describe other facilities providing animal care and use support, such as feedmills, diagnostic laboratories, abattoirs, etc.

The farm contains a feed mill that processes cattle, swine and sheep feed. The AFS Meats Lab is a USDA inspected abattoir.

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According to the privacy principles on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, we wish to advise you that the personal data in the Program Description will become part a permanent file owned by AAALAC International, and that can be shared with AAALAC International offices and representatives in order to perform an evaluation of the institution´s animal care and use program and provide accreditation services. The institution has the option of exercising rights of data access, rectification, cancellation, and opposition at: accredit@aaalac.org

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Appendix 1: Glossary of Abbreviations and Acronyms

Please provide a Table defining abbreviations and acronyms used in this Program Description.

Abbreviation/Acronym	Definition
ABSL	Animal Biosafety Level
ACS	Animal Care Services
AFS	Animal & Food Sciences
AUF	Animal Use Form
AUP	Animal Use Protocol
AV	Attending Veterinarian
AVMA	American Veterinary Medical Association
AWA	Animal Welfare Act
BSB	Biological Sciences Building
CITI	Collaborative Institutional Training Initiative
CV	Clinical Veterinarian
DMR	Designated Member Review
EHS	Environmental Health & Safety
EQF	Erskine Quail Facility
ESB	Experimental Sciences Building
ESB II	Experimental Sciences Building II
FASS	Federation of Animal Science Societies
FCR	Full Committee Review
HSB	Human Sciences Building
HVAC	Heating Ventilation Air Conditioning
IACUC	Institutional Animal Care and Use Committee
iCARE	Interagency Collaborative Animal Research Education
IBC	Institutional Biosafety Committee
IVC	Individually Ventilated Caging
LDF	Littlefield Deer Facility
NDF	New Deal Farm
PAM	Post-Approval Monitor
PHS	Public Health Policy
PI	Principal Investigator

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Appendix 1: Glossary of Abbreviations and Acronyms

Abbreviation/Acronym	Definition
PSS	Plant & Soil Science
RNB	Ruminant Nutrition Barn
RLSC	Radiation Laser Safety Committee
SCAW	Scientists Center for Animal Welfare
STZ	Streptozotocin
TCEQ	Texas Commission on Environmental Quality
TIEHH	The Institute for Environmental and Human Health
TTEC	Texas Tech Equestrian Center
TTRC	Tech Therapeutic Riding Center
TTU	Texas Tech University
TTUHSC	Texas Tech Health Sciences Center
USDA	United States Department of Agriculture
WRAP	Web-based Risk Assessment Program

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The next 46 pages have been withheld pursuant to 418.181

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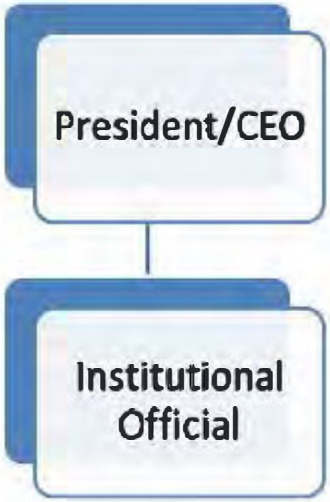
Appendix 4: Organizational Chart(s)

Organizational Chart
Regulatory Chain of Command



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Appendix 4: Organizational Chart(s)

Organizational Chart
Budgetary Chain of Command

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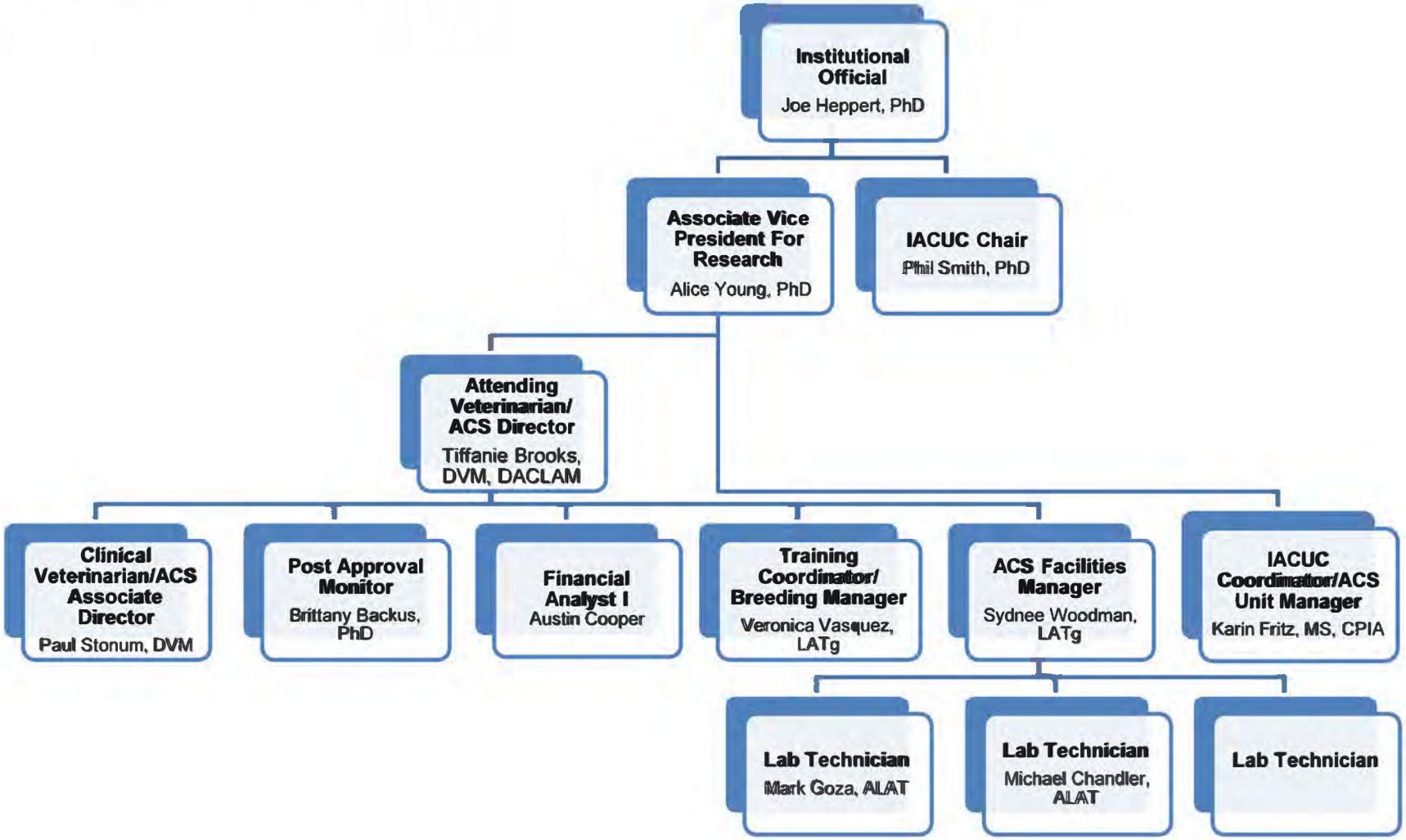
Appendix 4: Organizational Chart(s)

Organizational Chart
Animal Care Services and IACUC



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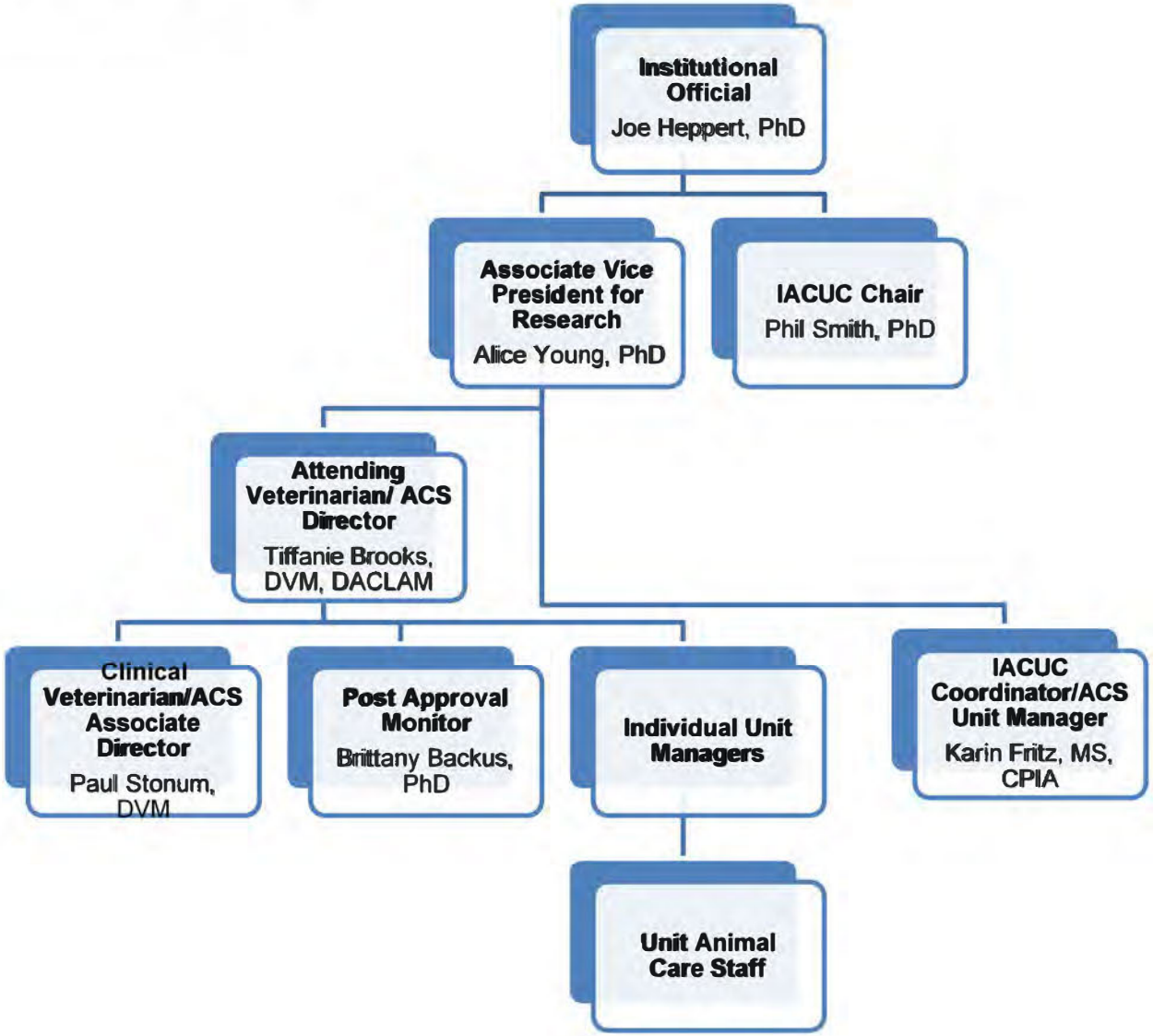
Appendix 4: Organizational Chart(s)

Organizational Chart
Facilities Not Managed by Animal Care Services



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Appendix 5: Animal Usage

In order to assist the site visitors in their evaluation of the animal care and use program, please provide the information requested below. Information should be provided for all animals approved for use in research, teaching or testing, including those which may be used or housed in laboratories outside the animal care facility. Of particular interest is information on those animals which are used in research projects involving recovery surgical procedures, behavioral or other testing requiring chairing or other forms of restraint, or exposure to potentially hazardous materials. An alternate format is acceptable as long as the information requested is provided.

(1) If applicable, please provide a description / definition of any pain/distress classification used within this Appendix in the space below. If pain/distress categories are not used, leave blank.
(2) Survival Surgery (SS)
(3) Multiple Survival Surgery (MSS)
(4) Food or Fluid Regulation (FFR)
(5) Prolonged Restraint (PR)
(6) Hazardous Agent Use (HAU)
(7) Non-Centralized Housing and/or Procedural Areas (NCA), i.e., use of live animals in any facility, room, or area that is not directly maintained or managed by the animal resources program, such as investigator laboratories, department-managed areas, teaching laboratories, etc.

Pain/Distress Classification Description/Definition, if applicable:

See TTU Policy 02 USDA Pain and Distress Categories-Guidelines for Assignment

Category	Definition	Comments
Category B	Used for Breeding or holding animal where no research is being conducted	
Category C	Procedures, routine injections of non-toxic, non-irritating substances or venipuncture that produces minimal, transient, or no pain or distress	
Category D*	These Procedures would cause more than minimal or transient pain/ or distress, but are preformed using appropriate anesthetics, analgesics, or tranquillizers.	

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Appendix 5: Animal Usage

Category E*	These procedures cause more than minimal or transient pain and/or distress but cannot be performed using anesthetics, analgesics or tranquilizers without adversely affecting the study. Mechanical restraint may, depending upon duration and type of restraint, be considered a category "E" study.	Approval to conduct category "E" studies requires detailed scientific justification in a separate paragraph (see section IV). This information must be forwarded by UCHC to the USDA (for USDA Covered Species only) as part of the annual report and is accessible to the general public via the USDA Website in accordance with the freedom of information act.

In the Table below, provide an approximate annual usage for all species:

Animal Type or Species	Approximate Annual Use	Animal Type or Species	Approximate Annual Use
Mouse	5061	Goat	102
Rat	279	Horse	158
Rabbit	5	Fish	4840
Squirrel	15	Reptiles	252
Dog	3690	Porcupines	2
Cat	42	Amphibians	566
Pig	6524	Bats	2781
Cattle	2644	Raccoons	8
Sheep	447	Elk	11
Armadillos	1	Camel	1
Birds	1671	Deer	47
Opossum	12	Llama	3
Gophers	65	Badger	2
Bobcat	1	Pronghorn	45

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Helminth Infection and Their Impact on Northern Bobwhite and Scaled Quail Living in the Rolling Plains of Texas	16071-08	[redacted]	Quail	2984	C						
ANSC 2303; Care and Management of Companion Animals	16076-08	[redacted]	Dogs Cats	60 Dogs 10 Cats	C						
ANSC 4401: Swine Production	16077-09	[redacted]	Swine	5052	C						
Maintenance of Ruminal and Duodenal Cannulated Steers and Sampling of Ruminal and Duodenal Contents	16079-08	[redacted]	Cattle	40	C						
Pollen Grains for Oral Drug Delivery; Pollen Grains as Trojan horses for oral vaccination	16082-08	[redacted]	Mice	3360	E			x		x	
Texas Tech Rodeo	16083-09	[redacted]	Horses Cattle Goats	30 Horses 810 Cattle 90 Goats	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Mist Net Survey of Bats at Fort Walters, Mineral Wells, Texas	16085-09	[redacted]	Bats	6000	C						
Zebrafish Breeding and Maintenance Protocol	16086-09	[redacted]	Zebrafish	800	B						
Project I: C/EBPb regulates macrophage foam cell formation and apoptosis in atherosclerosis Project II: Role of C/EBPb in macrophage cholesterol homeostasis and inflammasome activation in diabetes	16088-11	[redacted]	Mice	150	D					x	
Pilot Study to Test Insulin Signaling Antagonists in Vivo	16089-09	[redacted]	Mice	70	C						
Breeding Mice for Experiments; Resistance mechanisms to pore-forming toxins; Dnase1L3 Inhibition As One Strategy to Promote Remyelination; Role for Dnase1L3 Inhibitor in Treating Multiple Sclerosis; Dnase1L3 Regulation of the Inflammasome in Pediatric-onset Lupus; Mechanism of Egress for a Killer Protein; Nuclear Mechanisms of Inflammasome Activation; Role for the Inflammasome in Preventing Pediatric-onset Lupus; Dnase1L3 Regulation of the Inflammasome; Cellular Blinding By Pore-forming Toxins; Hot-wiring Anti-Tumor Immunity; Tissue resident macrophages in cancer metastasis; Mouse Models for Pediatrci-Onset Lupus; Testing One Potential Treatment for Lupus; Contribution of Dnase1L3 to Lupus Disease Heterogeneity; Exploring an intracellular role for Dnase1L3 during inflammation	16090-10	[redacted]	Mice	692	D						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Experimental Autoimmune Encephalomyelitis in Mice; Dnase1L3 Inhibition As One Strategy to Promote Remyelination; Role for Dnase1L3 Inhibitor in Treating Multiple Sclerosis; Mechanism of Egress for a Killer Protein; Nuclear Mechanisms of Inflammasome Activation;	16091-10	[redacted]	Mice	400	E					x	
Preparation of macrophages from mice; Resistance mechanisms to pore-forming toxins; Dnase1L3 Inhibition As One Strategy to Promote Remyelination; Role for Dnase1L3 Inhibitor in Treating Multiple Sclerosis; Dnase1L3 Regulation of the Inflammasome in Pediatric-onset Lupus; Mechanism of Egress for a Killer Protein; Nuclear Mechanisms of Inflammasome Activation; Role for the Inflammasome in Preventing Pediatric-onset Lupus Dnase1L3 Regulation of the Inflammasome; Cellular Blinding By Pore-forming Toxins; Hot-wiring Anti-Tumor Immunity; Tissue resident macrophages in cancer metastasis; Testing One Potential Treatment for Lupus; Contribution of Dnase1L3 to Lupus Disease Heterogeneity; Exploring an intracellular role for Dnase1L3 during inflammation	16092-10		Mice	306	C						
Population characteristics of the feral pigeon and avian community structure along an urban gradient; Genetic assessment of pigeon populations at TTU and vicinity	16093-10		Pigeons	1,998 Pigeons 23,100 Birds	C						
ACS Rodent Sentinel Program	16094-09		Mice	348	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Bat pollination of baobabs in Africa	16100-10	[redacted]	Bats	200	C						
Possible Maternal Pheromone in Sows Feces	16105-11	[redacted]	Swine	620	C						
Evaluation of Influenza Vaccines in Animal Models	16106-12	[redacted]	Mice	6400	E					x	
Chronic Toxicity Study with Quail	16108-12	[redacted]	Quail	970	E					x	
ANSC 4403 Beef Production	17001-01	[redacted]	Cattle	1,800	C						
University Mascot	17002-02	[redacted]	Horses	3	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Pilot study to understand the role of neuronal activation and metabolism	17003-01	[redacted]	Mice	25	C			x			
Evaluation of the Impacts of Trace Organics (emerging contaminants) from Wastewater dominated streams in Lubbock	17008-02	[redacted]	Fish	6,500 eggs 300 adults	E					x	
Determining trace amine associated receptor	17009-02	[redacted]	Fish	2500	E					x	
Natural Pheromone Effects on Animals	17010-02	[redacted]	Dog Cat Deer Swine Horse	Dogs 160 Cats 127 Deer 32 Swine 20,400 Horse 20	C						
Surgical Rumen Cannulation of Cattle	17012-01	[redacted]	Cattle	24	D	x					
NRM 4306 Upland Game Ecology and NRM 5314 Advanced Upland Game Ecology	17015-02	[redacted]	Birds	20	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Northern Bobwhite Breeding Colony	17017-02	[redacted]	Bobwhites	2,640	B						
Distribution and Abundance Surveys of Mammals	17018-02	[redacted]	Wild Mammals	1500	D						
The Development of Hyperglycemia in *Xenopus Laevis* Using Streptozotocin (STZ)	17019-03	[redacted]	Xenopus	36	E					x	x
To study the Insulin sparing effect of adenoviral protein E4orf1	17020-02	[redacted]	Mice	200	E					x	
Mechanisms Behind the Effects of Bariatric Surgery on Branched-Chain Amino Acid Metabolism	17021-02	[redacted]	Mice Rats	342 Rats 312 Mice	D		x				x
Cortisol analogs improve weanling pig health and growth and provide an alternative to antibiotics	17022-02	[redacted]	Swine	2480	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Biological Diversity and Epidemiological Surveys of Mammals	17023-04	[redacted]	Wild Mammals Bats	3000	D						
Mammalogy (ZOOL 4406 and 5402) and Vertebrate Natural History (ZOOL 4407 and 5407)	17024-02	[redacted]	Wild Mammals Birds Reptiles Amphibians Fish Bats	2400	D						
Field Ecology (BIOL 3301) at the Junction Campus	17025-03	[redacted]	Wild Mammals	1500	C						
Response of bat diversity to a sustainable tropical agroforestry program in the rural Borneo highlands	17026-07	[redacted]	Bats	3600	C						
Microneedle-based delivery of vaccines	17027-03	[redacted]	Mice	1000	C					x	

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
SENSORY PATHWAYS UNDERLYING NEUROPEPTIDE REGULATION OF FOOD INTAKE	17028-03	[redacted]	Xenopus	510	D	x		x			x
Pharmacokinetic study of free and nanoencapsulated compounds	17029-03	[redacted]	Rats	75	C	x					
Population Dynamics and Disease of Free-Ranging Axis Deer in Central Texas	17030-04	[redacted]	Axis White-Tail	225-290	D						
ANSC 3308 Clinical Veterinary Science	17032-03	[redacted]	Sheep Cattle Horses Pigs Dogs Cats Mice Rats	72 Horses 108 Pigs 90 Sheep 90 Dogs 90 Cats 36 Mice 36 Cattle 36 Rats	C						
ANSC 3403 (Selection, Care, Processing and Cooking of Meats) ANSC 3404 (Consumer Selection and Utilization of Meat Products) ANSC 3403-H01 (Selection, Care, Processing and Cooking of Meats - Honors)	17033-04	[redacted]	Cattle Swine Sheep Goats	30 Cattle 75 Swine 60 Sheep 60 Goats	C						
Studying mechanisms of neuronal communication in the central nervous system	17035-04	[redacted]	Mice	288	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Equine Teaching Program - Brady: ANSC 2310- Horses in World Art; ANSC 3303- Horse Management; ANSC 3309-Principles of Hippotherapy, ANSC 4000-Internship, ANSC 4001-Special Problems, ANSC 5000 Internship, ANSC 5001- Special Problems	17036-04	[redacted]	Horses	50	C						
Pronghorn fawn survival in east central New Mexico	17037-04	[redacted]	Pronghorn	270	C						
Elk calf survival in the Jemez Mountains of New Mexico	17038-04	[redacted]	Elk	90	C						
Efficacy of Medicated Feed in Northern Bobwhite Quail	17039-04	[redacted]	Quail	380	C						
Tract tracing of Urocortin 3 neurons innervating the ventromedial forebrain in a frog	17041-05	[redacted]	Frogs	20	C						x
Home range of rock pigeons	17043-05	[redacted]	Birds	1999	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Livestock and Horse Evaluation Courses: ANSC 2301 Livestock and Meat Evaluation I, ANSC 2302 Livestock and Meat Evaluation II, ANSC 3203 Livestock and Meat Judging and ANSC 3204 Advanced Livestock, Horse, and Meat Judging	17044-04	[redacted]	Cattle Sheep Swine Goats	375 Cattle 375 Swine 375 Sheep 375 Goats 375 Horses	C						
Effects of zilpaterol hydrochloride on growth performance, carcass characteristics, and meat quality attributes of yearling bulls fed byproduct-based diets in Honduras	17045-05	[redacted]	Cattle	480	C						
Development of palatal cell lines from mouse	17046-05	[redacted]	Mice	300	C						
Ecology of Swainson's Hawks	17047-05	[redacted]	Swainson's Hawks	1950	C						
A multidimensional approach to assess olfaction in dogs with application to explosives detection	17049-05	[redacted]	Dogs	1750	C						
Evidence for a functioning Edinger Westphal nucleus in amphibians II.	17050-06	[redacted]	Leopard Frogs	18	D	x					x

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Equine-Assisted Counseling and Wellness Teaching Program; ANSC 4000/5000, ANSC 4001/5001, ANSC 4301/5301	17051-05	[redacted]	Horses	75	C						
Schroeder Research Program: Assessing Equine-Assisted Counseling and Wellness Programs	17052-12	[redacted]	Horses	25	C						
Conservation assessment and ecosystem services of the Egyptian fruit bat (Rousettus aegyptiacus): Pollination, seed dispersal, and hunting effects in Southern Nigeria	17055-06	[redacted]	Bats	1400	D	x					
Equine Teaching Program: ANSC 1401-Introduction to Animal Science, ANSC 2304-Selection and Evaluation of Horses, ANSC 3304-Training and Management of Horses, ANSC 4402-Horse Production, ANSC 3312-Horsemanship I, ANSC 3313-Horsemanship II, ANSC 4000-Internship, ANSC 4001-Special Problems, ANSC 5000-Internship, ANSC 5001-Special Problems, ANSC 5404-Physiology of Reproduction, ANSC 5402-Advanced Horse Production, ANSC 6001-Supervised Teaching, Equestrian Team, Ranch Horse Team, FFA Career Development Events and Clinics, youth summer horse camps (IDEAL camps such as Super Saturdays and Science It's a Girl Thing).	17056-06	[redacted]	Horses Cattle Buffalo	40 Horses 150 Cattle 15 Buffalo	C						
Contaminant Concentrations of Desert Rodents	17057-06	[redacted]	Wild Rats Chipmunks	50 rats 25 Chipmunks	E						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Anti-atherosclerotic effects of T0901317 nanoencapsulated nanocarriers	17059-08	[redacted]	Mice	140	C					x	
ANSC 1401 - Introduction to Animal Science	17061-06	[redacted]	Cattle Sheep Swine	Cattle 258 Sheep 108 Swine 108	C						
Neural and hormonal regulation of cardiac function	17062-08	[redacted]	Mice Rats	80 Rats 120 Mice	D		x	x			x
Undergraduate training in wildlife Techniques	17066-08	[redacted]	Mammals Amphibians Reptiles	mammals 4500; amphibians 6000; reptiles 600; 200 waterfowl 600; prairie dogs 3000	C						
Breeding and maintenance protocol for feeder mice colony	17068-08	[redacted]	Mice Rats	900 Mice 210 Rats	E						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Sheep and Goat Breeding Herd Maintenance; ANSC 4406 and ANSC 5312 (Sheep and Goat Production)	17069-07	[redacted]	Sheep Llama Goats	750 Sheep 3 Llamas 75 Goats	C						
Treatment of temporomandibular joint (jaw) pain	17070-08	[redacted]	Rats	455	E						
Building Capacity in the Honduran Cattle Industry Through Investment In Research And Education	17074-08	[redacted]	Cattle	3000	C						
ANSC 4101 Dog Training Practicum	17075-08	[redacted]	Dogs	60	C						
Rodent training module	17076-08	[redacted]	Mice Rats	180 Mice 24 Rats	C						
A Survey of Reptiles and amphibians of the Lubbock Campuses of Texas Tech University	17077-08	[redacted]	Amphibians Reptiles	100	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Towards an improved method of piglet castration to reduce pain: the use of one incision in combination with the use of a Vapocoolant and Metacam™	17079-09	[redacted]	Swine	466	C						
Effect of Pet Dogs on Activity Levels in Children	17080-12	[redacted]	Dogs	120	C						x
Assessing the Role of Conservation Reserve Program Lands for Lesser Prairie-Chicken Ecology in Texas	17081-09	[redacted]	Prairie-Chickens	300	C						
Evaluation of Prescribed Fire and Grazing on Lesser Prairie-Chicken Ecology in Sand Shinnery Oak Prairies	17083-10	[redacted]	Lesser Prairie-Chickens	100	C						
Effects of Mesquite Removal on Small Mammal Microhabitat Selection and Detectability	17084-10	[redacted]	Wild Mammals	21,711	C						
Use of Highway Structures by Bats in the Trans-Pecos Ecoregion of Texas: Inventory and Assessment of Relative Contributions of Characteristics of Landscape, Habitat and Highway Structures in Determining Day-Roost Utilization	17085-09	[redacted]	Bats	9,000	C						
ANSC 4400 (Advanced Meat Science and Muscle Biology) ANSC 5400 (Advanced Meat Science and Muscle Biology)	17086-12	[redacted]	Cattle Swine Sheep Goats	30 Cattle 60 Swine 60 Sheep 60 Goats	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Evaluation of muscle fiber number in lambs born to ewes implanted with trembolone acetate and estradiol during early pregnancy	17087-11	[redacted]	Sheep	216	D						
Measurements of Gait and Balance in Two-and Three-Year-Old Children with Gross Motor Developmental Delay Participating in a Program of Hippotherapy	17089-10	[redacted]	Horses	25	C						
Determining efficacy of a cream formulation in equine wound healing and scar reduction. Determining efficacy of a new cream formulation for prophylactic sunburn protection and after sunburn treatment/healing.	17091-10	[redacted]	Horses	20	C						
Overwinter Ecology of Bats in the southern United States	17092-12	[redacted]	Bats	1400 Bats 10 Birds	C						
Winter Ecology of American Kestrels	17095-11	[redacted]	Birds	78	C						
Breed Variation of Olfactory Capacity	17098-11	[redacted]	Dogs	48	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Impact of beef protein diets on reducing the risk of developing diabetes and obesity in diet-induced obese mouse models	18001-03	[redacted]	Mice	320	C						
Academic Quadrathlon- Lab Practicum	18004-02	[redacted]	Horse Cattle Sheep Goat Swine Chickens	18 Horses 18 Sheep 18 Goats 24 Cattle 24 Chickens 18 Swine	C						
Effect of telotristat ethyl (TE) on myxomatous mitral valves	18006-01	[redacted]	Mice	200	D	x					
1) Pig as an animal model for assessment of oral vaccination 2) Pig as an animal model for evaluating allergy immunotherapy	18007-01	[redacted]	Pigs	1536	E			x		x	
Ag animal training module	18009-01	[redacted]	Cattle Goats Sheep Horses Swine	Cattle 150 Goat 150 Horses 150 Sheep 150 Pigs 150	C						
ANSC 3314 Companion Animal Behavior and Training	18010-02	[redacted]	Dogs	32	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Community processes structuring assembly and disassembly of bat gut-microbial communities across a gradient of habitat degradation	18011-03	[redacted]	Bats	1200	C						
Breeding Protocol for Fathead minnow (*Pimephales promelas*)	18012-01	[redacted]	Zebrafish	500	B						
Landscape ecology and metacommunity dynamics of mammals in north east Texas with a focus on the distribution of the Texas Kangaroo Rat	18013-02	[redacted]	Wild Rodents	5100	C						
Territory Settlement in Forest Birds	18015-02	[redacted]	Birds	240	C						
ZOOL 4409/5409	18019-02	[redacted]	Rats Frogs Goldfish Mice	Rats 12 Frogs 90 Goldfish 24 Mice 30	C						
White Tailed Deer Breeding Herd	18020-02	[redacted]	Deer	20	B						x
Maintenance of Pen Raised Northern Bobwhite Quail	18021-01	[redacted]	Quail	300	B						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Dynamics of Zoonotic Systems: Human-Bat-Pathogen Interactions	18022-02	[redacted]	Bats	3600	C	x					
Breeding Protocol: Apolipoprotein E*3-Leiden and Human Cholesteryl Ester Transfer Protein Transgenic Mice and Lepr db/db Heterozygous Mice	18023-02	[redacted]	Mice	1980	C						
Parental high salt diet and the development of autism spectrum disorder in offspring	18025-02	[redacted]	Mice	2160	E						x
Determination of Color Intensity of Blue Dye in Fat Tissues and Residue Concentration of Warfarin in Liver, Muscle, and Fat of Feral Hogs (Sus Scrofa) fed Kaput® Feral Hog Bait	18028-02	[redacted]	Feral Hogs	44	E						
Surveying Mammals and Herpetofauna to Further Knowledge of Species Distributions Across Texas	18029-03	[redacted]	Reptiles Amphibians Wild Mammals	600 each	C						
Estimating survival rate of parent-reared northern bobwhites released into the wild	18031-04	[redacted]	Quail	1050	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Manipulating Microclimates to Reduce Disease Severity from WNS	18032-12	[redacted]	Bats	180	E			x			x
Effects of direct-fed microbial supplementation on dietary nutrient digestibility and fecal characteristics of dogs	18033-04	[redacted]	Dogs	18	C						
Comparison of transdermal and intravenous delivery of bioactive compounds and drugs for browning white adipose tissue and evaluate their effects on obesity, atherosclerosis, fatty liver disease and diabetes	18038-04	[redacted]	Mice	762	D					x	x
NRM 6002: Techniques in Bat Ecology and NRM-6002 Mammals of the Lincoln National Forest	18040-04	[redacted]	Bats	1800	C						
ANSC 5001 - Special Problems: Research Methodology in Ruminant Nutrition	18041-05	[redacted]	Cattle Sheep	Cattle 6 Sheep 24	C						
Breeding Protocol: Maintenance and characterization of Ad36E4orf1-APP transgenic mice	18042-05	[redacted]	Mice	600	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Interceptive Eavesdropping on Complementary Information in Sciurid Rodents	18043-05	[redacted]	Chipmunks Birds	160 Chipmunks 75 Birds	C						
Immune Responses of Northern Bobwhite to Antigens and Infection of Eyeworms and Caecal Worms	18044-05	[redacted]	Quail	80	C						
The Boar Pheromone	18045-05	[redacted]	Swine	127,400	C						
Floss mediated sublingual allergen immunotherapy, Allergen coated floss for allergy treatment	18046-05	[redacted]	Mice	3270	E					x	
TTU Swine Health Surveillance Program	18047-05	[redacted]	Swine	461	C						
Horse for Health: Assessing Equine-Assisted Activities and Terapies for Members of the U.S. Armed Services	18048-05	[redacted]	Horses	45	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Interior continental snowy plover breeding population demography in the Great Plains	18049-06	[redacted]	Birds	900	C						
Dnase1L3 as One Therapy for Lupus; Mouse Models for Pediatric-onset Lupus; Testing One Potential Treatment for Lupus; Contribution of Dnase1L3 to Lupus Disease Heterogeneity	18052-06	[redacted]	Mice	30	D					x	
Isolation of macrophages and dendritic cells from bone marrow precursors to study the immune response	18053-06	[redacted]	Mice	67	C						
NRM 3407 - Vegetation and Wildlife Inventory and Analysis Techniques at Junction (Summer 1)	18054-06	[redacted]	Wild Mammals Amphibians Birds	30 rats 90 mice 400 birds 30 toads 90 frogs	C						
Social Transmission of Food Preference in Canines	18056-07	[redacted]	Dogs	64	C						
Effects of Enrichment on Canine Welfare	18057-06	[redacted]	Dogs	96	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Genetics of Sharpnose Shiner and Smalleye Shiner	18058-07	[redacted]	Fish	240 adults 4000 juveniles	C						
General Bird Banding	18060-08	[redacted]	Birds	600	C						
Greater Roadrunner Response to Coastal Prairie Restoration	18061-08	[redacted]	Birds	20	C						
Survival and Site Fidelity of Juniper Titmice in Response to Pinyon-Juniper Thinning	18062-07	[redacted]	Birds	90	C						
Survival of Site Fidelity of Mississippi Kites	18063-08	[redacted]	Birds	46	C						
Cognitive, Behavioral, and Hormonal Assessment in Alzheimer's Disease Transgenic Mice	18064-07	[redacted]	Mice	182	D			x			

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Feed Intake During the Breeding and Non-Breeding Season	18065-08	[redacted]	Deer	120	C						x
Exploring American Alligator Ecology, Parasite Community Ecology and Comparative Population Genetics	18066-07	[redacted]	Reptiles	108	C				x		
Influence of Lactipro and feeding strategies on ruminal health and feedlot performance in light weight beef calves	18067-08	[redacted]	Cattle	135	C						
Catalyzing an open-community research and education program to leverage the microbiome for the advancement of organic livestock production, using mastitis as a test case	18068-10	[redacted]	Cattle	300	C						
Use of event related functional magnetic imaging (fMRI) to identify odor induced neural activity in the domestic dog	18069-08	[redacted]	Dogs	160	C						x

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Does Mesomammal Predator Reduction Increase Nest Success of Northern Bobwhites	18071-09	[redacted]	Northern Bobwhite; Coyote; Red Fox; Skunk; Opossum; Raccoon; Armadillo; Badger; Gray Fox; Feral Dog & Cat; Ringtail; Bobcat; Cottontail	Northern Bobwhite 480; Coyote 60; Red Fox 24; Skunk 560; Opossum 600; Raccoon 560; Armadillo 240; Badger 24; Gray Fox 24; Feral Dog 24 & 24 Cat; 24 Ringtail; Bobcat 30; Cottontail 30	C						
Investigating mechanisms of brain function in health and disease	18072-11	[redacted]	Mice	2760	E	x		x	x	x	x
Use of therapy dogs in therapy sessions with children with autism	18073-09	[redacted]	Dogs	50	C						x
To study the effect of nano-liposome mediated delivery of the anti-diabetic protein E4orf1	18074-09	[redacted]	Mice	70	E						
Examination of the effects of predator avoidance on gene expression in the optic tectum	18076-10	[redacted]	Xenopus	60	D						x

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
TTU Polo Club Bring a Horse to Campus for Recruiting	18078-10	[redacted]	Horse	1	C						
Effects of bismuth subsalicylate and encapsulated calcium-ammonium nitrate on fed cattle performance, nutrient digestibility, and enteric methane emissions	18079-11	[redacted]	Cattle	230	D						
Evaluation of Feeding Immunoglobulin Y to Holstein Feeder Cattle for the Control of Liver Abscesses Using Pre- and Post-Mortem Techniques	18080-10	[redacted]	Cattle	80	C			x			
The metaphylactic use of tildipirosin (ZuprevoTM) for the control of Bovine Respiratory Disease (BRD) in pre-weaned high-risk calves housed in individual hutches	18081-10	[redacted]	Cattle	2100	C						
Micrroneedles for Allergy Immunotherapy	18082-10	[redacted]	Mice	3540	E					x	
Petting Zoo for Fundraiser Event	18084-10	[redacted]	Llama Swine Rabbit Goats Ducks	Llama 2 Swine 4 Rabbit 12 Goats 12 Ducks 12	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Canine Olfactory Limits of Detection	18085-10	[redacted]	Dogs	72	C						x
Using Effort Quantify Reinforcer Value in Dogs	18086-11	[redacted]	Dogs	72	C						
Companion Animal Nutrition Classroom Research Experience	18087-10	[redacted]	Dogs	72	C						
Changes in anxiety-associated behavior in Streptozotocin (STZ)-injected hyperglycemic African clawed frogs (Xenopus laevis)	18089-11	[redacted]	Xenopus	56	E					x	x
Supplementation of L28 Direct-Fed Microbial on Growth Performance, Feed Efficiency, and Pathogen Shedding in Beef Cattle Fed Conventional Diets Supplemented with and without Sub-Therapeutic Antibiotics	18090-11	[redacted]	Cattle	300	C						
Intradermal and subcutaneous delivery of collagen gels for sustained drug delivery	18092-12	[redacted]	Mice	20	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Evaluation of zinc methionine complex on performance and muscle fiber type	18095-11	[redacted]	Cattle	232	C						
Investigating behavioral mechanisms of persistence and discrimination learning	18096-11	[redacted]	Dogs	16	C						
Breeding Protocol: Characterization of mouse models for obesity, diabetes, Alzheimer and hypertension	18098-11	[redacted]	Mice	1,000	D						
Temporary Holding Protocol	18102-12	[redacted]	All Animals	22,500	C						
Spatial ecology and population demographics of the eastern spotted skunk	18103-12	[redacted]	Skunks	60	C						
Methods and devices for peanut allergy treatment	19002-01	[redacted]	Mice	2800	E					x	

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Do you smell like a dog?	19003-01	[redacted]	Dogs	18	C						
ANSC 4001: Wildlife Issues in South Africa	19004-01	[redacted]	Elephant	100	C						
Use of live birds for Ornithology - TTU Center at Junction	19005-02	[redacted]	Birds	600	C						
Woodpecker Transposable Elements and Genome Evaluations	19006-03	[redacted]	Birds	207	D						
Influence of Woody Vegetation Patterns on Scaled Quail and Bobwhite Demographics	19007-01	[redacted]	Scaled Quail Bobwhite	1905	C						
NRM 1401 Introduction to Natural Resource Management	19008-01	[redacted]	Wild mammals Fish	600 small mammals 450 fish	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Horse-Human Interactions Research Program: Assessments of Equine Temperament, Attachment, Sociability, and Preference	19011-01	[redacted]	Horses	30	C						
Using Mice as Models to Study Leishmania Infection	19013-03	[redacted]	Mice	300	E					x	
Dietary Comparison and Parasite Survey for Quail and Migratory Songbirds from the Rolling Plains of Texas	19015-02	[redacted]	Birds	260	C						
Applying a Novel Individual Identification Tool using Scute Patterns for Captive or Farm Raised Cuban Crocodiles (Crocodylus rhombifer) from the Zapata Swamp, Cuba	19016-02	[redacted]	Crocodiles	130	C						
Evaluation of Current Western Sandhill Cran Polulation Delinations	19019-03	[redacted]	Birds	1080	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Desert Massasauga and Spot Tailed Earless Lizard Phase I	19020-02	[redacted]	Snakes Lizards	Snakes 600 Lizards 675	C						
Investigating the Impact of a Diet Featuring pH Enhanced Ground Beef on Reducing the Rick of Developing Care and Obesity	19021-02	[redacted]	Mice	320	D						x
Effect of nitrate on performance and greenhouse gas emissions of growing beef cattle	19022-02	[redacted]	Cattle	50	C						
Influence of Parasitism on Bobwhite Survival	19023-04	[redacted]	Birds	300	C						
Broilers and Laying Hens for FFA Career Development Events	19024-02	[redacted]	Chickens	138	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Predicting Metritis Cure as a Path to Reducing Antimicrobial Use in Dairy Cows	19025-02	[redacted]	Cattle	400	C						
X-ray fluorescence spectrometry use in external markers detection on ovine systems: a validation attempt	19026-03	[redacted]	Sheep	8	C				x		
Grassland Herps and Mesquite	19027-03	[redacted]	Amphibians Reptiles	10,200	C						
Effect of Therapy Dog Handling Styles on Dog and Child Behavior	19028-02	[redacted]	Dogs	20	C						x
Trophic Transfer of Microplastics in Daphina Magna and Fathead Minnow	19029-03	[redacted]	Fish	30	D			x		x	
Genomics of exceptions to scaling of longevity to body size	19032-04	[redacted]	Bats	20	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
The prevalence and effects of heavy metals on Texas alligators across inland and coastal habitats	19033-05	[redacted]	Alligators	369	C				x		
Nutritional and Hormone Regulation of Adipose Tissue Metabolism and Inflammation in Obesity, Insulin Resistance and Hypertension Project I: Mechanisms linking the renin angiotensin system to obesity and diabetes Project II: Effects of caloric restriction vs low fat and high fat diets Project III: Use of bioactive components of food to prevent and/or reverse obesity, inflammation and insulin resistance	19034-04	[redacted]	Mice	1339	D			x			
Integrated Crop/Forage/Livestock Systems for the Texas High Plains	19035-05	[redacted]	Cattle	220	C						
Home Range and Habitat Use of Zone-tailed Hawks	19036-04	[redacted]	Hawk	18	C						
In vivo pilot studies of transdermal delivery of dye using microneedle and iontophoresis patches	19037-05	[redacted]	Mice	24	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Habitat quality and landscape arrangement affect amphibian reproduction	19038-04	[redacted]	Amphibians	28,800Tadpoles 11,520 Adults	C						
Home Range and Movement Patterns of Burrowing Owls in Proximity to Wind Turbines	19039-06	[redacted]	Owl	60	C						
Dietary Bioactive Components to Prevent Neurodegenerative Diseases	19040-06	[redacted]	Mice	200	E						
Fidelity, Longevity and Productivity of American Kestrels	19041-06	[redacted]	Birds	1100	C						
Improving glycemic control in mice by chemical analog compounds expressing Ad36 E4orf1	19042-05	[redacted]	Mice	500	D						
Body composition, foraging, and heterothermy in spring migrating bats	19043-05	[redacted]	Bats	900; 360 opportunistic; 30 birds (non-target)	C						x
Desert Amphibian Reproduction and Habitat Use	19044-05	[redacted]	Amphibians	800 Adult 135,000Tadpoles	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Effect of injectable trace mineral supplementation on oxidative stress, immune parameters, and reproductive performance in dairy cows undergoing the transition period in heat stress conditions	19045-05	[redacted]	Cattle	1000	C						
Molecular Mechanism of Folic Acid-Induced Renal Fibrosis in Mice Model	19046-05	[redacted]	Mice	138	D					x	
Measuring olfactory sensitivity and insensitivity of boar pheromone in Peri-pubertal gilts.	19047-05	[redacted]	Swine	100	C						
Cattle Breeding Herd and Growing Cattle Maintenance	19048-05	[redacted]	Cattle Horses Donkey	2739 Cattle 15 Horses 9 Donkeys	C						
A Course in Field Herpetology and Advanced Field Herpetology	19049-05	[redacted]	Snakes Reptiles Amphibians	225	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
ANSC 4202 Artificial Insemination of Bovine	19050-05	[redacted]	Cattle	600	C						
Assessing the spatial ecology of beef cattle and vegetative composition of a high intensity grazing regime in regards to lesser prairie chicken management implications	19051-06	[redacted]	Cattle	60	C						
Does the Release of Pen-Reared Northern Bobwhites Influence the Genetic Diversity of Wild Quail Populations in the Rolling Plains of Texas	19053-06	[redacted]	Quail	6000	C						
Vermin Control at TTU Agricultural Facilities with Resident Barn Cats	19054-06	[redacted]	Cats	45	D	x					
ANSC 4408-ANSC 4001 (sect 032) - Animal Shelter Management	19055-06	[redacted]	Cats Dogs	360 Dogs 360Cats	D	x					

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Using Domestics Dogs to Demonstrate Reinforcement Training in PSY 3317 (the Psychology of Learning); PSY 3401 (Research Methods); PSY 1300 (General Psychology)	19056-06	[redacted]	Dogs	2	C						
Breeding Protocol: Maintenance and characterization of Ad36E4orf1 transgenic mice	19057-06	[redacted]	Mice	600	D						
Anthelminitic Treatment of Northern Bobwhite Quail	19058-06	[redacted]	Quail	64	D						
Swine Breeding Herd Maintenance at New Deal Swine Center	19059-07	[redacted]	Swine	6375	C						
Llama/Camal Use - Study Abroad Week	19060-06	[redacted]	Camel Llama	1 Camel 2 Llamas	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Optimizing Vigilance and Pavlovian Instrumental Transfer in Detection Canines	19061-07	[redacted]	Dogs	72	C						
Behavioral and background predictors of success and improved well-being in a foster home	19062-06	[redacted]	Cat	150	C						
Maintenance of lower vertebrates for DNA analysis and educational demonstration purposes	19063-06	[redacted]	Snakes Lizards	105 Snakes 6 Lizards	C						
1) General beef cattle ear implant & blood collection for preliminary data.	19065-07	[redacted]	Cattle	54	C						
Maintenance of Ruminnaly and Duodenally Cannulated Steers and Sampling of Ruminal and Duodenal Contents	19067-07	[redacted]	Cattle	40	C						

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Appendix 5: Animal Usage

Protocol Title	IACUC #	PI	Species	# Animals Approved	UPC	SS	MSS	FFR	PR	HAU	NCA
Maintenance of growing and finishing cattle at the Texas Tech University Burnett Center	19068-07	[redacted]	Cattle	750	C						
Evaluating the use of anxiolytics to reverse anxiety-like symptoms in a novel predator avoidance test.	19069-07	[redacted]	Frogs	120	C						

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Appendix 6: Personnel Medical Evaluation Form

Provide a ***blank*** copy of form(s) used by medically-trained personnel to review individual health assessment, individual risk assessment, health history evaluation, health questionnaire, periodic medical evaluation, etc. If form(s) are not used, include a description of how such evaluations are performed in the Program Description (Section 2.I.A.2.b.ii.1).d), Section 2 (Description). I (Animal Care and Use Program). A (Program Management). 2 (Personnel Management). b (Occupational Health and Safety or Personnel). ii (Standard Working Conditions and Baseline Precautions). 1) (Medical Evaluation and Preventive Medicine for Personnel). d).

The online Occupational Health and Safety risk assessment that must be completed on an annual basis can be viewed online at: 2018-2019_Non-TTU_OHS. The link TTU personnel receive is behind our eraider (required sign-in) firewall, to help ensure the assessment is indeed completed by the individual it is intended for.

The Medical Evaluation on the following page is completed by all individuals listed on a NIH/NSF funded project on an annual basis, or any individuals that wishes, at anytime, to meet with an Occ-Med physician.

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Appendix 6: Personnel Medical Evaluation Form

TEXAS TECH UNIVERSITY

Environmental Health *and* Safety

Occupational Health Program Risk Assessment and Enrollment Form

This Initial Health Questionnaire is designed to provide Occupational Health with the following:

(a) Information about occupational exposure and risks associated with the position identified in Section 1.1;
(b) Medical information related to your ability to safely perform the functions of the position; and
(c) A baseline medical history for ongoing medical surveillance purposes.

For questions or assistance, contact Environmental Health and Safety Occupational Health at 806.742.3876 or ehs.ohp@ttu.edu

Section 1.0 Occupational Exposure

Section 1.1: Job Information

Full Name (Last, First, MI):				R#:	Today's Date
DOB:(dd/mm/yyyy)	Gender:	☐	Male	Phone Number:	Email:
		☐	Female		

Job/Position Title	Lab/Department	Campus/Office Location/Bldg. and Room#

Supervisor/PI Name	Supervisor/PI Phone #	Supervisor/PI Email iacuc@ttu.edu

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Appendix 6: Personnel Medical Evaluation Form

Emergency Contact Information:		
Full Name (Last, First, MI):	Phone Number	Relationship
Regular Physician Name	Physician Phone #	

Position Description:					
☐	Initial	☐	Annual	☐	Contractor
☐	Employee/Student	☐	Adjunct	☐	Other

Initial Health Status Questionnaire **Page 1 of 5**

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Appendix 6: Personnel Medical Evaluation Form

Section 1.2 Workplace Environment (Check All that Apply)					
Please indicate the Workplace type(s) below whose primary use best fits the type of Workplace the position requires work or access to. For example, if the position is administrative but within an animal care facility, the workplace type is "Animal Care Facility."					
☐	Research Laboratory	☐	Animal Care Facility	☐	Teaching Laboratory
☐	Access to all workplaces *(environmental services, emergency response/EHS, Public Safety, etc.)*				

Exposures:		If "checked", explain:
☐	I will be working with pathogens (BSL-2, BSL-3), in vitro only, (with no animal use)	
☐	I am enrolled in IRB, IBC, or IACUC protocol	
☐	I will be working in areas where pathogens (BSL-2, BSL-3, ABSL-2) are used.	
☐	I will have contact with human materials (cell lines, tissue, body fluids, blood)	
☐	I will have contact with human body fluids/waste (saliva, urine, feces)	
☐	I will have contact with untreated human sewage/wastewater	
☐	I will have contact with non-human primate materials (cell lines, tissue, body fluids, blood)	
☐	I will have contact to biological hazards examples: botulism, conotoxin, tetrodotoxin, etc.	
☐	I will have contact with sources of radiation or radioactive material	
☐	I will have contact with vertebrate animals, their waste, blood, body fluids, or cell lines or items soiled with the same	

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Appendix 6: Personnel Medical Evaluation Form

☐	I will be working in field (outdoor research)	
☐	I will be working with insects, plants or fungi	
☐	I will have contact with animals, animal cells, carcasses, feces, urine, tissue or human cells, tissues, biological agents, Recombinant (rDNA).	
☐	I will be working with heavy metals example: copper, chromium, lead etc.	
☐	I will be working with anti-neoplastic drugs or controlled substances	
☐	I will have contact with hazardous or toxic chemicals	
☐	I will work with respiratory hazards, chemical vapors, certain biohazards, confined spaces, and other particulates and thus need Pulmonary Function Test/Medical Clearance to wear Respirators (half face/full face/PAPR/N95)	
☐	I will work with class IIIB or IV lasers	

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Appendix 6: Personnel Medical Evaluation Form

☐	I will be working in an area where hearing protection is needed	
☐	I will be working with "Other Hazard" not listed above	
☐	I am enrolling after an incident	
☐	I will be working with anesthetic gases	
☐	I will be working with reproductive hazards	
☐	I will be working with Insects, Plants or Fungi	
☐	I will be working with needles/scalpels/sharps	

Section 2.0: Risk Assessment

Section 2.1: Exposure to Animals

YES	NO			
☐	☐	Does this position require contact with animals? If "YES", please identify the type(s) of animal species below.		
☐		Amphibians	☐	Fish
☐		Birds	☐	Reptiles
☐		Companion Animals *(List Specific: Dogs, Cats)*	☐	Wild Mammals *(please identify)*
☐		Lab Rodents *(List Specific: Mice, Rats, Ferrets, Rabbits, Hamsters)*	☐	Livestock *(List Specific: Horses, Cattle, Sheep, Swine, Goats)*

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☐		☐	
☐	Other Non-human primates *(please identify other species below)*:	☐	Other *(please identify other species below)*:

Section 2.2: Exposure to Infectious Agents

YES	NO	
☐	☐	Does this position require work with infectious agents? If "YES", please describe the type(s) of infectious agents below.

If you answered 'No' and did not check any of the questions above, you are not required to enroll in the EHS Occupational Health program.
Please email this form to ehs.ohp@ttu.edu or send to EHS Occupational Health Program MS 1090.
If your risk/health status changes at any time, please contact TTU EHS.
If you answered 'Yes' or checked any of the questions above, continue to the next page.

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Appendix 6: Personnel Medical Evaluation Form

Section 3.0: Participation in medical/health surveillance activities

Section 3.1: Participation information

Note: EHS does not make medical assessments or recommendations. Medical assessments or recommendations are conducted through a university approved occupational health provider.

- You may decline medical/health surveillance activities. Declining medical/health surveillance participation gives you access to educational materials, training, personal protective equipment, and other support services aimed at preventing occupational injuries and exposures; however; no medical surveillance will be offered.
  In certain cases, if you decline to participate, you may be denied access to certain facilities or prohibited from certain activities that can pose a health risk.
- If you are an employee, accepting participation gives you access to appropriate occupational medical surveillance/services at no cost to you, as well as all educational materials, training, personal protective equipment, and other support services aimed at preventing occupational injuries and exposures.

Section 3.2: Acknowledgement and Waiver Statement

- I have reviewed the information concerning the TTU Occupational Health Program in this document and as posted on the websites:
  - http://www.dept.ehs.ttu.edu/ehs/ehshome/occupationalsafety/OccupationHealthProgram
  - http://www.depts.ttu.edu/iacuc/Occupational.php
- I understand that my recurring animal contact or exposure to biological, chemical or physical hazards may have a health risk exposure, and I am advised to have a health assessment. I also understand health risks are associated with not accepting the health assessment and occupational health surveillance program.
- I have answered this form truthfully and to the best of my recollection.

Based on your completion of this form, please check one of the following and sign:

☐	I decline medical surveillance services.	☐	I accept medical surveillance services.

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Appendix 6: Personnel Medical Evaluation Form

Based on your completion of this form, please check one of the following and sign:			
☐	I decline medical surveillance services.	☐	I accept medical surveillance services.
Signature:			

If you are declining medical surveillance, you have now completed the OHP Risk Assessment and Enrollment Form. Please email this form to ehs.ohp@ttu.edu.

If your risk/health status changes or you decide you want to accept medical surveillance services, please send an email to ehs.ohp@ttu.edu.

If you have accepted medical surveillance services, please complete Section 4.0.

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Appendix 6: Personnel Medical Evaluation Form

Section 4.0: Medical History

Section 4.1: Immunizations

Please check all the boxes that apply to indicate which immunizations you have received in the past:

☐	Tetanus Vaccination	☐	Hepatitis A Vaccinations (series of 2)	☐	Hepatitis B Vaccinations (series of 3)
☐	Influenza	☐	Polio	☐	MMR
☐	Rabies	☐	Rubella	☐	Robiola
☐	Smallpox	☐	Tetanus	☐	DPT/Tdap Diphtheria Pertussis
☐	Chickenpox	☐	PPD TB Skin test	☐	Other:

Section 4.2: Immune Status		If "checked", explain:
☐	Have you been diagnosed with a condition that weakens your immune system?	
☐	Do you currently take any medication that weakens your immune system?	
☐	Have you been diagnosed with a valvular or congenital heart condition?	
☐	Have you ever changed jobs/work habits due to health issues from an occupational exposure?	

Section 4.3: Asthma/Allergies		If "checked", explain:
☐	Do you have allergies (i.e., latex/chemical/animal/food allergies, etc.)? If yes, how severe? (mild/moderate/severe)	
☐	Do you have contact with pets, livestock, wildlife or other work place exposures outside of work hours?	

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Appendix 6: Personnel Medical Evaluation Form

Section 4.4: Additional Health Concerns		If "checked", explain:
☐	Do you have any workplace health concerns (including pregnancy or current medical treatment) or specific concerns working with animals and health risks to discuss with an Occupational Medicine Provider?	
Section 4.5: Other		**Explain:**
What outside hobbies, or employment or animal exposures do you have that would predispose you to risk of injury with your work duties at TTU?		

Thank you! You have now completed the OHP Risk Assessment and Enrollment Form.

If your risk/health status changes or you decide you want to accept medical surveillance services, please send an email to ehs.ohp@ttu.edu.

For questions, comments or concerns, please contact:

Occupational Health Program
Environmental Health and Safety Texas Tech University
MS 1090
2903, 4th street

Room no: 121
Lubbock, TX 79409
ehs.ohp@ttu.edu
806.742.3876

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Appendix 6: Personnel Medical Evaluation Form

TEXAS TECH UNIVERSITY
Environmental Health *and* Safety

Occupational Health Program Risk

Health Care Provider Form

***To be Completed by the Health Care Provider**		
Full Name (Last, First, MI):	Phone Number	Email
I have reviewed the questionnaire listed above and:		

☐	I do not recommend a visit to the clinic.
☐	I am recommending a visit to the clinic (for physical examination or further testing)
☐	I request that the employee contact Occ-Med at their earliest convenience. (Phone: 806-795-7433)
☐	Meets essential physical qualifications for the job per OHP Questionnaire.
☐	Does not meet essential physical qualifications for the job. (See comments below)

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Appendix 6: Personnel Medical Evaluation Form

☐	Meets essential physical qualifications for the job per OHP Questionnaire.
☐	Does not meet essential physical qualifications for the job. (See comments below)

Physician Comments
_____ _____ _____ _____ _____ _____ _____ _____

Health Care Provider Signature:	**Date:**

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Appendix 7: IACUC/OB Membership Roster

Please provide a Committee roster, indicating names, degrees, membership role, and affiliation (e.g., Department/Division).

Name of Member	Degree/ Credentials	Position Title	PHS Policy Membership Requirements
Phil Smith	M.S., Ph.D.	Associate Professor of Environmental Toxicology	Chair, Scientist
Tiffanie Brooks	M.S., D.V.M., DACLAM	Attending Veterinarian; Director of Animal Care Services; Instructor of Animal and Food Sciences	Veterinarian
Bradford Goodwin	M.S., D.V.M., DACLAM	Consulting Veterinarian	Veterinarian/Alternate for Tiffanie Brooks
Paul Stonum	D.V.M.	Clinical Veterinarian	Veterinarian
Jordan Crago	M.S. Ph.D.	Assistant Professor of Environmental Toxicology	Scientist/Alternate for Ernest Smith
Harvinder Gill	Ph.D.	Associate Professor of Chemical Engineering	Scientist
Sean Childers	M.S.	Assistant Vice President of Operations	Non-Scientist/Alternate for Erica Irlbeck
Kerry Griffis-Kyle	M.S., Ph.D.	Associate Professor of Natural Resources Management	Scientist
Vijay Hegde	M.S., Ph.D.	Assistant Professor of Nutritional Sciences	Scientist/Vice-Chair
Erica Irlbeck	M.S., Ph.D.	Associate Professor of Agricultural Education and Communications	Non-Scientist

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Appendix 7: IACUC/OB Membership Roster

Rob Lee	M.S.	Retired U.S. Wildlife and Fisheries	Nonaffiliated (Community Member)
Rebecca Maloney	M.S.	Senior Safety Officer of Environmental Health and Safety	Environmental Health and Safety
Lou Densmore	M.S., Ph.D.	Professor of Biology	Scientist
Arlene Garcia	M.S., Ph.D.	Assistant Professor of Animal and Food Sciences	Scientist
Jhones Sarturi	M.S., Ph.D.	Assistant Professor of Animal and Food Sciences	Scientist
David Ray	M.A.T., Ph.D.	Associate Professor of Biology	Scientist
Matt Roe	M.S.	Assistant Vice President of Environmental Health and Safety	Environmental Health and Safety/Alternate for Rebecca Maloney
Ernest Smith	Ph.D.	Professor of Environmental Toxicology	Scientist
Richard Stevens	M.S., Ph.D.	Professor of Natural Resources Management	Scientist
Sydnee Woodman	B.S., LATg	Animal Care Services Facilities Manager	Scientist
Nathan Hall	M.S., Ph.D.	Assistant Professor of Animal and Food Sciences	Scientist/Alternate for Alexandra Protopopova that exited from the University on July 15, 2019
Manuel DeLeon	M.S.	Wildlife Biologist of Natural Resources Conservation Service	Community Member/Alternate for Rob Lee

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Appendix 8: IACUC/OB Minutes

Please provide the latest two Minutes of the IACUC/OB meetings.

Texas Tech University

Animal Care and Use Committee
Meeting Minutes

Tuesday, May 14, 2019
9:00 AM - 12:00 PM
Administration Building, Room 244

Members in Attendance: ☒
Absent Member: ☐

Member			Member		
Brooks	☒		Densmore	☒	
E Smith	☒		Garcia	☐	
Gill	☐		Griffis-Kyle	☒	
Hegde	☒		Irlbeck	☐	
Lee	☒	Arrived 9:40 AM	Maloney	☒	Arrived at 9:30 AM
Protopopova	☐		P Smith	☒	
Ray	☒	Arrived 9:50 AM	Sarturi	☒	
Stevens	☐		Stonum	☒	
Woodman	☒				

Alt. Member

Childers	☐		Crago	☒
DeLeon	☐		Goodwin	☐
Hall	☐		Roe	☒

Also in attendance: Karin Fritz, Joe Heppert, Kelsea Brown, and Brittany Backus

Absent with Notification: Brad Goodwin, Manuel DeLeon, Erica Irlbeck, Alexandra Protopopova, and Harvinder Gill

Meeting brought to order at 9:04 a.m. by Phil Smith. This is when a quorum was established. Required Members for Quorum: 9. Number of Members Attended: 10

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Appendix 8: IACUC/OB Minutes

Approval/correction Friday, April 19, 2019 ACUC meeting minutes:

Paul moved to approve the minutes as written.
Vijay seconded the motion.
The motion carried unanimously.

REVIEW ANIMAL USE FORMS, AMENDMENTS, TERMINATED, ARPR:
The committee reviewed the approvals and the annual review forms for the first half of the month.

Phil read over the list of protocols approved, amendments approved, and annual reviews that had been submitted. Protocols, amendments, and annual reviews were available at the meeting for review by committee members.

FULL COMMITTEE REVIEWS
I. 19010-01 Community Outreach for Dogs in Underserved Neighborhoods

PI: Alexandra Protopopova

Lead Reviewer: Tiffanie Brooks

- This protocol was called for re-review.

Tiffanie has concerns with vaccinating the animals in the owners' homes. There are potential complications with the vaccinations causing reactions. There are also human safety concerns with the dogs being protective of its owner and territory. These issues could put the university at risk.

The committee would like to see a vet present at the vaccination site. Members mentioned to have this function at a community center. Kelsea stressed that by conducting this project at a community center they would not be seeking the original research objective of the project. Kelsea was very firm on this this.

Rob informed Kelsea that cold calling is generally not perceived well. He provided a suggestion to notify city council individuals that are well perceived and community members respect their opinion. This could help citizens understand who you are and what you are trying to achieve.

The IRB waiver form was referenced several times, regarding what participants will be made aware of and notification of risks.

There were no definite resolutions made between Kelsea at the IACUC during the meeting. Questions will be compiled among the members and sent to the PI in order to resolve this.

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Appendix 8: IACUC/OB Minutes

This AUP will be sent back through the DMR process for further review. Reviewers that were identified include Matt, Sydnee, Rob, Tiffanie and Paul.

Additional discussion for this protocol can be found in the folder, current protocol 19010-01, May 2019 amendment.

Tiffanie moved to continue to re-review this protocol through the DMR process.
David seconded the motion.
The motion carried unanimously.

II. T19032 Genomics of exceptions to scaling of longevity to body size in bats
PI: David Ray
Lead Reviewer: Phil Smith

- Called for full committee review regarding Occ-Med approval.

Occ-Med states that is take 31 days in order to receive the titer test results. At the time of the meeting, the PI had not been cleared by Occ-Med. The other individual listed on the protocol has been cleared. The PI added the following statement to A5, “Personnel without an up-to-date rabies titer will not be allowed to participate in handling any bats.” Since this is a NSF funded project, an exemption to approve the protocol was requested without the clearance for the PI.

Kerry moved to approve the exemption, which was to approve the protocol without clearance for the PI from Occ-Med.
Tiffanie seconded the motion.
The motion carried unanimously.

OTHER BUSINESS

I. PAM Report

Video and pictures were provided to the committee for training purposes.

II. Update on [redacted] Suspensions, Probation Period Scheduled to End May 19, 2019

Sydnee provided an update on [redacted] lab. [redacted] informed the committee of pending trainings for personnel in her lab.

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Vijay moved to lift the probation period on May 19, 2019.
Tiffanie seconded the motion.
The motion carried unanimously.

III. Update on Semi-Annual Deficiencies

Karin read over a list of deficiencies that had not been resolved within the two week period. None of these deficiencies are deemed significant.

IV. AAALAC Site Visit: Postposed to November

V. Issues with Personnel Amendments

Phil requested for Paul to provide a draft AUP for the next meeting that includes the personnel section as a separate form.

VI. Jhones mentioned to the committee that Darren Henry could be a prospective IACUC member.

POLICIES/SOPs/LOPs

I. SOP018 Manager Rounds (Reviewed by Sydnee Woodman)

Rob moved to the SOP as edited.
Paul seconded the motion.
The motion carried unanimously.

II. SOP042 Decontamination of Animal Rooms and Procedural Areas (Reviewed by Sydnee Woodman)

Members discussed and clarifications were requested.

Rebecca moved to approve the SOP with additional clarifications.
David seconded the motion.
The motion carried unanimously.

III. SOP046 Rabbit Husbandry (Reviewed by Sydnee Woodman)

Discussion occurred if this SOP should be moved to inactive. Members agreed it is best to keep it active.

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Kerry moved to approve the SOP as edited.
Vijay seconded the motion.
The motion carried unanimously.

IV. New Policy: The Use of Tricaine Methanesulfonate (MS-222) in Fishes and Other Aquatic Animals (Tabled During the March Meeting)

Tiffanie questioned if this needs to be a university policy and not an IACUC policy? Additionally, more aquatic individuals need to review this before it is approved.

This policy was tabled for further review.

V. SOP040 Zebrafish Husbandry (Reviewed by Jordan Crago)

Jordan stated that the euthanasia section needs to be edited.

Rob moved to approve the SOP with clarifications.
Paul seconded the motion.
The motion carried unanimously.

VI. SOP052 Cat Husbandry (Reviewed by Sydnee Woodman)

Paul moved to approve the SOP as edited.
Vijay seconded the motion.
The motion carried unanimously.

VII. SOP065 National White-Nose Syndrome Decontamination (Deactivation Requested by Dr. Liam McGuire)

David and Kerry have requested to keep this SOP as active. They will both review it and provide updates/edits if needed.

This SOP was tabled for further review.

VIII. SOP061 Pain, Distress, Analgesia, and Anesthesia (Reviewed by Paul Stonum, No Edits Made)

Kerry moved to approve the SOP as written.
Rob seconded the motion.
The motion carried unanimously.

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Appendix 8: IACUC/OB Minutes

IX. Policy 24 Adverse Event Reporting and Unexpected Outcomes (Edited by Paul Stonum)

The additions were discussed among the members, which includes outlined information on when we should report.

David moved to approve the policy as edited.
Tiffanie seconded the motion.
The motion carried unanimously.

X. SOP003 Frog Room Care (Xenopus) (Additions)

Kerry moved to approve the SOP as edited.
Paul seconded the motion.
The motion carried unanimously.

Rob moved to adjourn the meeting.
Rebecca seconded the motion.
The motion carried unanimously.

The meeting ended at 11:30 AM.

Obtained by Rise for Animals. Uploaded 07/29/2020

Appendix 8: IACUC/OB Minutes

Texas Tech University

Animal Care and Use Committee
Meeting Minutes

Wednesday, June 19, 2019
12:00 PM – 3:00 PM
Administration Building, Room 244

Members in Attendance: ☒
Absent Member: ☐

Member			Member		
Brooks	☒		Densmore	☒	
E Smith	☒		Garcia	☐	
Gill	☒	Present 1-1:30 PM	Griffis-Kyle	☐	
Hegde	☒		Irlbeck	☐	
Lee	☒		Maloney	☒	
Protopopova	☐		P Smith	☒	
Ray	☒		Sarturi	☒	Arrived 12:45 PM
Stevens	☐		Stonum	☒	
Woodman	☒				

Alt. Member

Childers	☒		Crago	☐
DeLeon	☐		Goodwin	☐
Hall	☐		Roe	☒

Also in attendance: Karin Fritz, Joe Heppert, Alice Young, and Brittany Backus

Absent with Notification: Brad Goodwin, Kerry Griffis-Kyle, Alexandra Protopopova, and Manuel DeLeon

Meeting brought to order at 12:00 p.m. by Phil Smith. This is when a quorum was established. Required Members for Quorum: 9. Number of Members Attended: 11

Approval/correction Tuesday, May 14, 2019 ACUC meeting minutes:

Rob moved to approve the minutes with minor clarifications.

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David seconded the motion.
The motion carried unanimously.

REVIEW ANIMAL USE FORMS, AMENDMENTS, TERMINATED, ARPR:
The committee reviewed the approvals and the annual review forms for the first half of the month.

Phil read over the list of protocols approved, amendments approved, and annual reviews that had been submitted. Protocols, amendments, and annual reviews were available at the meeting for review by committee members.

FULL COMMITTEE REVIEWS
I. 18073-09 Use of therapy dogs in therapy sessions with children with autism

Requested Change of PI and Funding Source

Original PI: Alexandra Protopopova
Proposed New PI: Wesley Dotson (did not sign, but have email confirmation he accepts as PI)

- Original PI is exiting from the University
- Dotson must be approved by Occ-Med

Lead Reviewer: Phil Smith

Karin informed the committee that the new proposed PI has not been cleared by Occ-Med at this time. The committee agreed that per our OLAW assurance the PI must be cleared by Occ-Med before the amendment can be approved.

Rob moved to process the amendment through the DMR pending Occ-Med approval.
Paul seconded the motion.
The motion carried unanimously.

II. T19064 Elastase-induced emphysema and its treatment
PI: Harvinder Gill
Lead Reviewer: Sydnee Woodman

The PI addressed the committee and described what this protocol was proposing and objectives of the study.

The committee requested for the PI to withdraw this AUP and resubmit as a pilot study. Dr. Gill agreed with this decision and will withdraw the AUP.

OTHER BUSINESS

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Appendix 8: IACUC/OB Minutes

I. PAM Report

Video and pictures were provided to the committee for training purposes.

Brittany brought up to the committee that [redacted] performed procedures on mice before a transfer was approved. Phil has requested for Brittany to form a memo reinforcing to the PI that all animal transfers must be approved before beginning any animal procedures.

II. Non-TTU Personnel Occ-Med Clearances

Members agreed that the legal contract seemed appropriate. However, our OLAW Assurance currently states that all individuals will be cleared by Occ-Med. Karin will schedule a meeting with appropriate individuals at OLAW to determine if we can edit our current assurance. Matt will edit our current vaccination policy to reflect the changes.

III. Update on Semi-Annual Deficiencies

Sean said to give him a few days to look into resealing/replacing the doors the Nutritional Sciences Building. An extension was granted for this deficiency to be completed.

The committee was also informed that the shade cloths at the beef center are not complete at this time, due to the heavy rainfall we have been receiving. Jhones informed the committee that work is currently in progress on this issue.

IV. Dog Adoption Policy

Tiffanie made the committee aware of what the AVMA dog adoption policy currently states. She believes knowledge of this policy could come into play on future protocols.

V. Personnel Amendment Form

Phil does not think the protocol form and the separate personnel form will go over well with PIs. He requested for Paul to look into other ways in order for the IACUC Office to identify when personnel are being added/deleted on the AUF.

Alice believes it might be a good idea to tie this into RedCap or Qualtrics.

Tiffanie expressed concerns with off-campus species specific training. These trainings need to occur and documentation must be available.

VI. Paul informed the committee that there is rapid progression at the farm.

VII. Tiffanie informed the committee animals will be moving in soon to ESB II. We will work to schedule a tour for the IACUC.

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VIII. Sydnee informed the committee she has come-up with a solution for those who access the restricted animal facilities. She will contact the PIs at the end of each semester to determine who no longer needs access.

POLICIES/SOPs/LOPs

I. SOP027 Health Risks of Collecting, Handling and Processing of Wild Rodents (This SOP was tabled during the January meeting in order to allow Paul to see if there are any SOPs that overlap with this one. Paul now believes that this SOP is not redundant and should remain. Grammatical errors were made and Dr. Todd Anderson's questions were addressed.)

The SOP was tabled to allow appropriate individuals to further review.

II. SOP012 Mascot Health Care (Edited by Paul Stonum)

The committee requested to add and/or TTEC as a housing location.

Rob moved to approve the SOP as edited.
Lou seconded the motion.
The motion carried unanimously.

III. SOP001 Fish Room Maintenance (Reviewed by Kerry Griffis-Kyle and Jordan Crago; No edits were made)

Rob moved to approve the SOP was edited.
Lou seconded the motion.
The motion carried unanimously.

IV. SOP021 Survival Surgery in Rodents (Edited by Tiffanie Brooks)

- Goodwin provided comments

Tiffanie moved to approve the SOP as edited.
Paul seconded the motion.
The motion carried unanimously.

V. SOP051 Poultry Room Maintenance (Edited by Leslie Thompson)

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Tiffanie moved to approve the SOP as edited.
Sydnee seconded the motion.
The motion carried unanimously.

VI. SOP067 Intravenous Tail Vein Injections (Edited by Shu Wang)

Rob moved to approve the SOP as edited.
David seconded the motion.
The motion carried unanimously.

VII. SOP066 Collection of Thioglycollate-Elicited Peritoneal (Edited by Shu Wang)

Rob moved to approve the SOP as edited.
Jhones seconded the motion.
The motion carried unanimously.

VIII. SOP069 Beef Cattle Heat Stress Prevention (Edited by Darren Henry)

Rob requested for remote sensors along with data loggers to be implemented at the facility. Members agreed with this suggestion.

David moved to approve the SOP as edited.
Sydnee seconded the motion.
The motion carried unanimously.

VIII. SOP065 National White-Nose Syndrome Decontamination

The link needs to be edited referencing the most up-to-date version.

David moved to approve the SOP as edited.
Vijay seconded the motion.
This motion was carried unanimously.

Rob moved to adjourn the meeting.
Lou seconded the motion.
The motion carried unanimously.
The meeting ended at 2:40 PM.

Obtained by Rise for Animals. Uploaded 07/29/2020

Appendix 9: Blank IACUC/OB Protocol Form

Please attach a ***blank*** copy of form(s) used by the IACUC/OB to review and approve studies. Include forms used for annual (or other periodic) renewal, modifications, amendments, etc., as applicable.

All forms can be found on our website: http://www.depts.ttu.edu/iacuc/Forms.php. The protocol form provides appropriate fillable sections based on previous selections.

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Appendix 9: Blank IACUC/OB Protocol Form

TEXAS TECH UNIVERSITY
Office *of the* Vice President *for* Research
Institutional Animal Care & Use Committee

***** IACUC Use Only *****

IACUC APPROVAL NO.
Expiration Date:
ORS Proposal Number:
Category:

PROTOCOL FOR THE USE OF **LIVE ANIMALS**
FOR RESEARCH, TEACHING OR DEMONSTRATION
Animal Use Form

A1. PERSONNEL INFORMATION

Protocol Title: (There may be multiple titles)

** I am requesting a title change to this approved Animal Use Protocol ○ Yes

Principal Investigator: Date Filed:

** I am requesting a change to the Principal Investigator of this Animal Use Protocol ○ Yes

Dept.: Office Phone: Cell Phone:

E-mail Address:

Will any of the funding for this research protocol come from Public Health Services (PHS) National Science Foundation (NSF) or the National Institutes of Health (NIH) sources? ○ Yes ○ No

Funding Source: ORS Proposal Number:

** I am requesting a change to the Funding of this approved Animal Use Protocol ○ Yes

Expected Start Date: Expected Completion:

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Expected Start Date: Expected Completion:

A2. EXPERIMENTAL TYPE, CLASS AND FUNCTIONS

Select the appropriate items below that represent the predominant goals of this protocol:

Project Type:

- ☐ Maintenance / Breeding
- ☐ Observational (No Handling or Housing)
- ☐ Research (Laboratory or on-campus)
- ☒ Research with Surgery
- ☐ Teaching / Demonstration
- ☐ Teaching/Field or Wildlife
- ☐ Wildlife Field Research (With or Without Surgery)

Project Animal Class: Check ALL that apply.

- ☐ Agriculture Animal
- ☐ Aquatic Animal
- ☐ Avian (non-wild caught)
- ☒ Biomedical Animal (Including Rodents, Pigs, Aquatic Species, etc.)
- ☐ Companion Animal
- ☐ Wildlife

A3. LAY SUMMARY

Describe in **lay terms (NON-SCIENTIFIC)** the methods and, the potential scientific benefit of the proposed study with respect to human or animal health, the advancement of knowledge, or the good of society (250 words or less):

A4. PAIN & DISTRESS

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Does the study include activities, procedures, or states of welfare that have the potential for producing pain or distress to the animal (Examples: procedures, spontaneous disease, genotype induced disease, tumor development)?

For an explanation of pain and distress in animals covered USDA Categories: See TTU Policy 'Categories of Pain and Distress'

- ○ **No. There is no potential for more than momentary pain or distress.**
- ○ **There is potential for more than momentary pain and distress, but is considered acceptable under normal husbandry or observational practices.**
- ◉ **Yes. There is a potential for more than momentary pain or distress.**

Regulations require that all studies which include procedures that may cause more than Momentary Pain or Distress, include an investigator consultation with the Veterinary Staff. This consultation is intended to deal with study design to address the management of pain or distress. Please indicate below the date that you consulted with the Veterinarian:

Veterinary Consultation Date:

What are the potentially painful or stressful conditions in this proposal?
(Examples: surgery, toxins, implants, tumor development, adjuvants, sepsis, infectious challenge)

Databases Searched (Check all databases searched.)

☐ AGRICOLA Data Base	☐ Altweb
☐ AltBib	☐ SCOPUS
☐ PubMed/MEDLINE (is considered one database)	☐ ToxNet
☐ Web of Science	☐ Biosis
☐ Animal Welfare Information Center (AWIC)	☐ Zoological Record
☐ Google Scholar	☐ Other (define):

A literature search for alternatives to the potentially painful conditions (listed above) was performed. The details are:

Date (day, month, year) literature search was performed:

Years Covered By The Search (From - To):

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Years Covered By The Search (From - To):

Key words, key word strings, and (or) search strategy used (use the following format for all key words):

"Alternative" + (key word):	Number of Hits:	Relevance:

Did the literature search reveal less painful alternatives to the potentially painful conditions that are proposed?

- No alternatives were found.
- Yes, but they are not suitable alternatives for the following reason(s):

A5. OVERVIEW OF EXPERIMENTAL DESIGN AND ANIMAL USE TIMELINES

Provide a **detailed SCIENTIFIC** summary of the overall experimental design. Describe the anticipated sequence of experimental events (timeline) such as breeding, preparation of animals, surgery, testing procedures, collection of tissues, euthanasia, etc.The description should define animal groups, group sizes, anticipated or established mortality for these procedures, and how each group will be tested or used. This section should include the use of any unique drugs or practices.

I am requesting an amendment to this approved Procedure ○ Yes

A6. STANDARD OPERATING PROCEDURES USED IN THE EXPERIMENTAL DESIGN

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Some of the "nuts and bolts" procedures of a protocol can be adequately explained with the use of Standard Operating Procedures previously approved by the TTU IACUC Committee. These can be referenced in the following sections, thus reducing your time in completing the Animal Use Form, and may reduce or eliminate the need to include that type of description of procedures.

- ☒ This project will incorporate IACUC approved Standard Operating Procedures (SOP's)
- ☐ This project will incorporate IACUC reviewed Lab Specific Operating Procedures (LOP's)
- ☐ No portion of this work will incorporate SOP or LOP's.

Please mark all of the following SOP's that are applicable for the work included in this Animal Use Form:

☐ Animal Transportation	☐ Animal Use with TTNI functional MRI Unit	☐ Aquatic Health Recommendations
☐ Barn Cats	☐ Beef Cattle Heat Stress Management	☐ Beef Center
☐ Biological Spills	☐ BSL II Rodent Husbandry	☐ BSL II Swine
☐ Burnett Center for Research & Instruction	☐ CO2 Inhalant Euthanasia	☐ Cat Husbandry
☐ Collecting Data From Cattle	☐ Collect, Handle, Processes Wild Rodents	☐ Dairy Calf Husbandry
☐ Deer Facility	☐ Dog Husbandry	☐ EchoMRI Analyzer
☐ Ferret Husbandry	☐ Fish Field Collection Methods	☐ Fish Room Maintenance
☐ Frog Room Care (Xenopus)	☐ Housing Wild-Caught Rodents	☐ IV Tail Vein Injection in Mice
☐ Leopard Frog Room Maintenance	☐ Livestock Housed at Meat Lab	☐ Mascot Health Care
☐ Outside Sourced Swine Bio-security	☐ Pain, Distress, Analgesia & Anesthesia	☐ Peritoneal Macrophage Collection in Mice
☐ Poultry Room Maintenance	☐ Rabbit Husbandry	☐ Raptor Research Methods
☐ Reptile Room Maintenance	☐ Rodent Health Surveillance Program	☐ Sheep Center
☐ Snake Bite	☐ STZ Prep,Admin, Handling & Care	☐ Surgical Anesthesia
☐ Survival Surgery in Rodents	☐ Swine Blood Collection	☐ Swine Husbandry at AFS
☐ Swine Trailer Bio-Security Procedures	☐ Swine Unit	☐ Tail Snipping of Rodents

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- [ ] Swine Trailer Bio-Security Procedures
- [ ] Swine Unit
- [ ] Tail Snipping of Rodents
- [ ] TTEC Horse Herd Health
- [ ] TTU Rodeo Team Herd Health
- [ ] Toad Room Maintenance
- [ ] Toe-Clipping Amphibians & Reptiles
- [ ] Venomous Snake Room
- [ ] Ventilated Rodent Husbandry
- [ ] White-Nosed Syndrome Decontamination
- [ ] Wild Game Capture/Mark/Release Methods
- [ ] Zebrafish Husbandry

SECTION B: ANIMAL USE AND JUSTIFICATION

B1. ANIMAL NUMBERS

NOTE: If this is a renewal protocol and there are animals remaining on the expiring protocol, the number of animals remaining on the expiring protocol (and transferring to the new protocol) must be included in the number of animals requested under the new protocol. Animals on the expiring protocol will be transferred to the new protocol upon activation of the new protocol.

Species:	Sex:	Age or weight range:	Strain or Common Name:	Number required for 3-year protocol:

Source of the animals:
NOTE: If transferred from another TTU protocol, provide PI name and protocol number.

Add Species

I am requesting an amendment to the Species or Number of Animals ○ Yes

B2. JUSTIFICATION (applies to all animals)

The justification for using live vertebrate animals rather than alternative means of achieving the research goal is: (check all that

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apply.)

- ☐ The complexity of the processes being studied cannot be duplicated or modeled in simpler systems because:
- ☐ There is not enough information known about the processes being studied to design nonliving models. Explain:
- ☐ Other (explain):

This species was selected for the study because of the following attributes (select all that apply):

- ☐ The species in this protocol is the target species of this research
- ☐ A large database exists allowing comparisons with previous data.
- ☐ The anatomy or physiology is uniquely suited to the study proposed.
- ☐ This is the lowest species on the phylogenetic scale that is suitable for the proposed study.
- ☐ Other attributes. *(details required)*.

The number of animals requested for this protocol is based on the following (select all that apply):

- ☐ A statistical estimate of the number required to achieve statistical significance (Power Analysis).
  Example/Statistical Calculators: www.danielsoper.com www.statisticalsolutions.net www.depts.ttu.edu
- ☐ The minimum number to achieve the goals of the study in the absence of a statistical estimate (Literature Reference).
- ☐ The number necessary to obtain sufficient tissue or other material for testing or analysis.
- ☐ The number required to provide sufficient technical training or practice for the number of trainees expected (Teaching)
- ☐ The expected or established mortality associated with this procedure.
- ☐ Other *(details required)*.

B3. EH&S COMPLIANCE: (i.e. Use of Acutely Toxic Chemicals, Nanomaterials, Animal or Plant Pathogens, Recombinant DNA, or Radiation)

- ○ No. This protocol will not expose Humans or Animals to any Hazardous Agents
- ● Yes. This protocol will use Hazardous Agents

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Yes. This protocol will use Hazardous Agents

B3.1 HAZARDOUS AGENTS

Please indicate the type of hazardous agent(s): (check all that apply)

- ☐ Carcinogens / mutagens
- ☐ Tissue fixatives (formalin, paraformaldehyde)
- ☐ Toxicological agents
- ☐ Nanoparticles
- ☐ Other hazardous chemicals
- ☐ Laser
- ☐ Irradiator / x-ray machines
- ☐ Radioactive materials
- ☐ MRI/CT Scan
- ☐ Active virus / bacteria / prion
- ☐ Attenuated virus / bacteria
- ☐ Human/NHP cells, tissues, or fluids
- ☐ Recombinant DNA
- ☐ Stem Cells
- ☐ Transgenic Rodents
- ☐ Xenotransplantation

B3.2 DETAILS OF HAZARDOUS AGENT USE

	Agent (identify)	Dose and Frequency of Administration	Route of Administration	Duration of Treatment
Add Agent				

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B3.3 COMMITTEE APPROVAL

Has EH&S been consulted on the use of the agents?

- ☐ Yes
- ☐ No
- ☐ Not applicable

EH&S Personnel Contact: _____ Date: _____

Outcome: _____

Has the use of radioactive substances or recombinant DNA received approval from the appropriate Safety Committee?

- ☐ Yes
- ☐ No
- ☐ Not applicable

Safety Committee Approval Number: _____ Approval Date: _____

B3.4 SUPPORTING DOCUMENTS

Please provide any and all supporting documents related to the hazardous agents used in this study (i.e.: MSDS)

B4. IRB COMPLIANCE: (i.e. Use of Human subjects in conjunction with this protocol)

- ◉ Yes. This protocol has been through IRB Committee review/approval process.
- ○ No. This protocol has not been through IRB Committee review/approval process.

Safety Committee Approval Number: _____ Approval Date: _____

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B5. DUPLICATIVE PROCEDURES

Does the study include activities, procedures, or states of welfare that use of animals will result in unnecessary duplication of experiments (Examples: procedures, spontaneous disease, genotype induced disease, tumor development)?

- ○ No. There is no potential for duplication.
- ◉ Yes. There is potential for duplication.

A literature search for alternatives to the potentially duplicative experiments (listed above) was performed. The details are:

What are the potentially duplicative conditions in this proposal? (Examples: surgery, toxins, implants, tumor development, sepsis, infectious challenge)

Justification:

B6. PHARMACEUTICAL CHEMICALS & CONTROLLED SUBSTANCES USE:

Will this protocol include the use of non-pharmaceutical grade substances?

- Note 1: USDA (Policy #3) and The Guide (8th Edition) requires the use of pharmaceutical-grade substances **(medications, diluents, and extenders)** whenever they are available, even in acute procedures.
- Note 2: Non-pharmaceutical grade chemical compounds may be used in animals only after specific review and approval by the IACUC for reasons such as scientific necessity or non-availability of an acceptable veterinary or human pharmaceutical-grade product. Cost savings is not a justification for using non-pharmaceutical-grade compounds (exceptions for extraordinary costs of substances may be considered).
- Note 3: The IACUC shall consider the grade, purity, sterility, pH, pyrogenicity, osmolality, stability, site and route of administration, formulation, compatibility, and pharmacokinetics of the chemical or substance to be administered, as well as *animal welfare and scientific issues* relating to its use when determining whether to approve the use of non-pharmaceutical grade products. Inclusion of this information will assist the Committee's review of

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your request for use of non-pharmaceutical grade material in animals.

- ○ No. All chemicals and substances used in animals will be pharmaceutical grade.
- ◉ Yes. Some or all chemicals and substances used in animals will be non-pharmaceutical grade. Complete the table below:

	Non-pharmaceutical chemical or substance Required	Describe why each non-pharmaceutical grade chemical or substance is necessary
Add Chem./ Substance		

Will controlled substances be used for anesthesia, restraint, animal management, agent testing, or euthanasia?

- ○ No. Controlled Substances will not be used.
- ◉ Yes. Controlled Substances will be used.

☐ Yes. Controlled substances will be used. I DO NOT have the registrations at present, but I am/will apply for controlled substance registration. Until my controlled substances registrations are approved by the state & federal agencies, I will use the TTU Animal Care Services for necessary controlled substances used for sedation, anesthesia, analgesia, and euthanasia. An Amendment will be submitted when the state and federal registration numbers are received, to my protocol.

☐ Yes. Controlled substances will be used, but I will not obtain a controlled substance registration. TTU Animal Care Services will be present and provide necessary controlled substances for sedation, anesthesia, analgesia, and euthanasia, at the PI expense for ACS Time, Drugs and Materials.

☐ Yes. Controlled substances will be used. An Individual Controlled Substance Registration will provide controlled substances for sedation, anesthesia, analgesia, and euthanasia. TTU veterinary staff may provide controlled substance administration at my request. My controlled substance registrations are:

SECTION C: HOUSING & PROCEDURE ARRANGEMENTS

C1. ROUTINE ANIMAL CARE

Please indicate how long the proposed animal species will be housed

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○ Animals are only observed, held, housed or managed for less than 12 hours or in non-TTU facilities with non-TTU-owned animals

Animals will be housed in the following type of caging: (Chose all that apply)

☐ TTU Standard Small Animal Caging (IVC/Rack System-Rodent)

☐ TTU Standard USDA / Ag Guide animal housing

☐ Non-Standard housing (Contact the facilities manager (806) 834-2872)

Housing description and
Number of animals per housing unit:

Will there be Exemptions to the The Guide or Routine TTU Care Procedures (i.e. single housing, temp, humidity, enrichment, feed or water)

◉ Yes, I am Requesting Exemptions as follows:

○ No, I am not requesting any Exemptions

EXEMPTION FROM ANIMAL WELFARE STANDARDS

This section should be used to request exemptions from Texas Tech University Policy or the NRC *Guide for the Care and Use of Laboratory Animals* ("*Guide*") for scientific reasons. Specify the exemption(s) that are requested and complete the related item(s) as indicated.

C1.1 ☐ Exemption from Social Housing (pair or group housing)

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C1.2 ☐ Exemption from Standard Housing Density (Increased Housing Density)

C1.3 ☐ Exemption from Cage Change Frequency

C1.4 ☐ Exemption from Standard Water Change Frequency (Aquatics)

C1.5 ☐ Exemption to Allow Radios / Sound / Noise in Animal Areas

C1.6 ☐ Exemption from Standard Environmental Conditions (temperature, humidity, light level)

C1.7 ☐ Exemption from Environmental Enrichment (bedding, toys, treats, activities)

C1.8 ☐ Exemption from Free Choice Feed or Water

C1.9 ☐ Other Exemption Requests:

For the style of exemption noted above, describe the minimum quantity of feed or water which will be provided and the frequency or schedule of provision. EXAMPLE: Water: 'x' mls/kg/day/animal. Feed: maintain animals at 'x' % of the free feed body weight.

For the style of the exemption noted above, describe the impact of the proposed procedures upon the animals' well-being.

For the style of the exemption noted above, provide a clear scientific justification as it relates to the desired research outcomes.

For the style of the exemption noted above, provide a monitoring plan for physiologic or behavioral parameters (while animals are in a reduced intake status). EXAMPLE: weight, measures of hydration status or behavior, etc.

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For the style of the exemption noted above, describe which specific criteria will be used to determine when to remove an animal from study (humane endpoints) and criteria which will result in a veterinary consult. EXAMPLE: level of weight loss, hydration state, urine specific gravity, hematocrit, behavior change, etc.

FOR DEPRIVATION STUDIES ONLY: Describe the 'post-deprivation recovery plan' which will be used to return the animal to a state of normal hydration, body condition, etc. Include quantities, frequency, measures to assess progress, and veterinary involvement.

Check the appropriate box: I shall notify Animal Care Services staff PRIOR TO Initiating deprivation:

☐ YES ☐ No

Check the appropriate box: I shall notify Animal Care Services staff PRIOR TO Stopping deprivation:

☐ YES ☐ No

Are the animals in the proposed project wild captured animals?

- ○ No, animals are obtained from a commercial source.
- ○ Yes, these animals will be captures from wild animal population sources. Explain below:

C2. SPECIAL HUSBANDRY REQUIREMENTS

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Is approval requested for any special husbandry needs? Note that special husbandry needs that are approved must be implemented through direct arrangements with ACS or the facilities manager.

- ○ No. There are no special husbandry requirements.
- ◉ Yes. There are special husbandry needs.

Please provide a description of the special husbandry needs:

- ☐ Food restriction, other than for routine presurgical preparation. Please describe the food restriction plan.
- ☐ Water restriction. Please describe the water restriction plan.
- ☐ Other restrictions. Please define the restrictions and describe the restriction plan.
- ☐ Special caging. Please describe the plan for special caging.
- ☐ Special feed or feeding. Please define the special feed and describe the feeding plan.
- ☐ Special environment. Please describe the special environment plan.
- ☐ Other special needs. Please define the special needs and describe the plan for providing them.

C3. AQUATIC SPECIES

- ○ No . This protocol does not deal with Aquatic Species.
- ○ Yes work in this project will include Aquatic Species.

C4. LOCATION OF ANIMALS AND PROJECT

Please describe where animals will be located for this project:

I am requesting an amendment to this approved Animal Location ○ Yes

C5. ANIMAL DAILY & VETERINARY CARE

- ○ Daily care will be provided by TTU ACS or Herd Unit personnel
- ○ Daily Care will be provided by other:
- ○ Veterinary Care will be provided by TTU Veterinarians:

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○ Veterinary Care will be provided by other:

C6. LOCATION OF ANIMAL HEALTH / WELL-BEING RECORDS (not research data records)

Records documenting observation of animal health and well-being:

- ☐ Will be kept with the animal (next to or near the housing location).
- ☐ Will not be kept by the research staff.
- ☐ Will be kept at the following location:

SURGICAL & SPECIAL CONCERNS FOR ANIMAL USE

C7. SURVIVAL SURGERY

Will this protocol involve animals that will undergo surgical procedures from which they should survive?

- ○ No. This protocol will not subject animals to Surgical Procedures.
- ◉ Yes. This protocol will subject animals to Surgical Procedures.

SURVIVAL SURGERY PROCEDURES

C7.1 MULTIPLE SURVIVAL SURGERIES

Will any of the animals have undergone survival surgery prior to being entered into this study (e.g., by the vendor or under a different protocol)?

- ○ No. Animals will not have had prior survival surgery.

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- Yes. Animals will have had prior surgery (provide prior surgeries and include dates of the procedures):

Will any of the animals experience more than one survival surgery, including surgery prior to entering the study?

- No. Animals will have only one survival surgery procedure.
- Yes. Animals will have more than one survival surgery procedure (describe how the multiple survival surgeries, including any experienced prior to entering this study, are interrelated components of this protocol and why the multiple surgeries are necessary to achieve the scientific objective).

C7.2. SURGICAL PERSONNEL

List all personnel that will be performing anesthesia or survival surgery and any relevant/applicable training.

C7.3. NARRATIVE OF SURVIVAL SURGERY PROCEDURES UNDER THIS PROTOCOL

Description of survival surgery procedures:

Specify the method of wound closure:

Will all sutures and/or wound clips be allowed to remain in place beyond the 7th post-operative day?

- No. All sutures and/or wound clips will be removed on or before the 7th day after surgery.
- Yes. Sutures and/or wound clips will remain in place for more than 7 days.

C7.4. PRE-OPERATIVE ANIMAL SUPPORT (NOT ANESTHESIA)

Will these animals receive Pre-Operative Support?

- No. They will not receive any support.
- Yes. They will receive Pre-Op Support.

C7.5. PRE-OPERATIVE ANESTHESIA / SEDATION / TRANQUILIZATION

Will pre-operative anesthesia, sedation or tranquilization be provided to the animals?

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Will pre-operative anesthesia, sedation or tranquilization be provided to the animals?

- No. Drugs will not be administered to the animals prior to surgical anesthesia.
- Yes. Pre-operative drugs will be used to calm the animals. *(List below)*

C7.6. INTRA-OPERATIVE ANIMAL SUPPORT (NOT ANESTHESIA)

Will these animals receive Intra-Operative Support?

- No. They will not receive any support.
- Yes. They will receive Intra-Op Support.

C7.7. INTRA-OPERATIVE ANESTHESIA

Please list all agents and dosing regimens to be used for intra-operative anesthesia.

	Anesthetic Agent	Dose	Route of Administration	Frequency of Administration	Duration of Treatment
Add Agent					

C7.8. NEUROMUSCULAR BLOCKING AGENTS (PARALYTICS)

Will neuromuscular blocking agents (paralytics) be used at any time during the procedure?

- No. Neuromuscular blocking agents will not be used for the procedure.
- Yes. Neuromuscular blocking agents will be used. *(Provide details below)*

C7.9. MONITORING DURING ANESTHESIA

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Will These animals receive any special type of monitoring during anesthesia?

- No special monitoring will not be used for these procedures.
- Yes, animals will be monitored for these procedures. *(Provide details below)*

C7.10. POST-OP ANIMAL SUPPORT DURING RECOVERY FROM ANESTHESIA

Will these animals receive support during recovery after surgery?

- No post-operative support will be provided during recovery from the procedure.
- Yes. Post-operative support will be provided during recovery. *(Provide details below)*

C7.11. MONITORING DURING RECOVERY FROM ANESTHESIA

Will these animals receive monitoring during recovery from anesthesia?

- No additional monitoring will be performed during recovery.
- Yes, monitoring will be performed during recovery. *(Provide details below)*

C7.12. PAIN MANAGEMENT

NOTE: The TTU IACUC encourages the use of pre-emptive analgesia for pain management. Analgesia must be provided as early in the procedure as possible, ideally before the procedure begins. See the TTU website **Veterinarian Recommended Analgesics & Anesthetics** for more information on post-operative support expectations)

Will analgesia be provided to the animal for relief of post-operative pain?

- No. Post-operative analgesia will not be provided.
- Yes. Analgesia will be provided. Please list analgesics and dosing regimens below:

C7.13. POST-OP ANTIBIOTIC OR DRUG THERAPY

Will antibiotics or drugs other than experimental agents be provided to animals during the post-operative period?

- No. Such treatment is not planned and will be provided only if medically advised.
- Yes. Antibiotics and/or drugs will be administered. (specify details below)

C7.14. SPECIMEN COLLECTION FROM LIVE ANIMALS

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Yes. Antibiotics and/or drugs will be administered. (specify details below)

C7.14. SPECIMEN COLLECTION FROM LIVE ANIMALS

Will specimens be collected from living animals during or after the survival surgery?

- No. Specimens will not be collected from living animals.
- Yes. Specimens will be collected from living animals.

C8. NON-SURVIVAL SURGERY

Will this protocol involve animals that will undergo surgical procedures from which they Will Not survive?

- No. This protocol will not subject animals to Non-Survival Surgical Procedures.
- Yes. This protocol will subject animals to Non-Survival Surgical Procedures.

C9. NON-SURGICAL PROCEDURES UNDER ANESTHESIA

Will this protocol involve animals that will undergo Non-Surgical procedures survive?

- No. This protocol will not subject animals to Non-Surgical Procedures.
- Yes. This protocol will subject animals to Non-Surgical Procedures.

C10. CHEMICAL RESTRAINT

Will this protocol involve the use of Chemical Restraint solely for immobilizing (non-surgical procedures) the animal?

- No. This protocol will not utilize any Chemical Restraint (other than Surgical Procedures)
- Yes. This protocol will use Chemical Restraint for immobilization.

C11. EXTENDED PHYSICAL RESTRAINT

Will the proposed research require the use of physical restraint (other than short-term hand-held) of awake animals?

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- ○ No. Physical restraint of awake animals will not exceed short-term hand restraint.
- ● Yes. Physical restraint must be used. I recognize and agree with the following:
  - ☐ Restraint devices shall not be considered a normal method of housing.
  - ☐ Restraint devices shall not be used as convenience in handling or managing animals.
  - ☐ Alternatives to physical restraint have been considered and cannot meet the requirements of my study.
  - ☐ The restraint period shall be the minimum required to accomplish my research objectives.
  - ☐ Animals shall be acclimated to the devices and personnel prior to actual research use.
  - ☐ Animals that fail to adapt shall be removed from the study.
  - ☐ Animals in restraint shall be observed at appropriate intervals, as described below.
  - ☐ Veterinary care shall be provided if lesions or illnesses associated with restraint are observed.
  - ☐ Clear explanation of the purpose of the restraint and its duration shall be provided to personnel involved.

Briefly describe or identify the restraint device:

Briefly describe the procedure for restraining the animal:

State the duration of the restraint period:

Describe the plan for observation of the animal during the period of restraint:

Describe the plan for animal care and support during the period of restraint to ensure comfort and well-being:

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C12. ACCLIMATION AND HABITUATION OF RESEARCH ANIMALS

According to The Guide, habituating animals to routine husbandry or experimental procedures may assist the animal to better cope with a captive environment by reducing stress associated with novel procedures or people. (See Policy on Acclimation) The type and duration of habituation needed will be determined by the complexity / novelty of the procedure. Please select the appropriate response:

Acclimation upon arrival to TTU:

- ○ The Policy on Acclimation will be followed.
- ○ I am unable to adhere to the Policy on Acclimation. My justification is:

Habituation for Husbandry or Experimental Procedures

- ○ Habituation is not necessary. This protocol does not present the animal with novel procedures or people which would require habituation or training to assist the animal with coping.
- ○ Habituation will NOT be performed do to the novel procedures in the experimental design which will necessitate that the animals not be habituated.
- ○ Habituation / training are performed as part of my research protocol. The methods I will use include:

C13. WITHHOLDING OF ANESTHETICS OR ANALGESICS

Does this protocol involve procedures that are expected to cause pain, but for which pain-relieving anesthetics and/or analgesics will not be provided (USDA Pain Category E Protocols)?

- ○ No. There are no painful procedures (i.e., no greater pain than would be expected from simple injections).
- ○ No. Anesthetics and/or analgesics will be provided for pain relief.
- ○ Yes. This protocol includes painful procedures for which anesthetics and/or analgesics must be withheld.

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SECTION D: ANIMAL WELL-BEING & HUMANE ENDPOINTS

D1. HUMANE ENDPOINTS

According to The Guide, information that is critical to the IACUC's assessment of appropriate endpoint consideration within a protocol includes precisely defining 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.

- This study will NOT have Humane endpoints that need evaluation, because no painful procedures will be performed.
- This study will NOT have Humane endpoints that need evaluation, because they are considered acceptable under normal husbandry or observational practices.
- This study will NOT contain humane endpoints because we cannot intervene per study design.
- This study will contain Humane and/or Experimental endpoints

D2. COMPLICATIONS

According to The Guide, researchers should consider the impact of their procedures upon the animals' well-being. Do you anticipate any animal health complications (e.g. local or systemic infection, physical or physiological impairment, heavy tumor burden, tumor necrosis, malnutrition, dehydration, etc.) arising from the experimental procedures or animal manipulations that are proposed in this protocol?

- No complications are expected.
- Yes complications may arise.

SECTION E: EUTHANASIA & DISPOSITION

E1. EUTHANASIA:

Please indicate the role of euthanasia in the proposed activity:

- Euthanasia is not planned, but will be performed to prevent animal distress. (As specified by IACUC approved SOP's)

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- ○ Animals will be euthanized as part of the experimental protocol. (Specify method below.)

** I am requesting a change in the Euthanasia for this approved Animal Use Protocol ○ Yes

E2. FINAL DISPOSITION OF ANIMALS

Indicate the method(s) of terminating responsibility for the live animals (select all that apply):

- ○ Live animals may be transferred to other approved TTU protocols to facilitate collaborative interactions and reduce overall animal usage and undue wastage.
- ○ Live animals may be returned to production / breeding unit.
- ○ Animals will be euthanized by methods specified in section E1 above (Euthanasia).
- ○ Animals will be harvested by humane slaughter. (Specify location below)
- ○ Other (specify):

E3. SHARING OF TISSUES, FLUIDS, OR CARCASSES

Indicate below if you anticipate sharing tissues, fluids, or carcasses post-euthanasia from this protocol:

- ○ No tissue sharing will occur with this protocol.
- ○ I may share tissues, fluids, or carcasses from my euthanatized animals with TTU researchers.
- ○ I may share tissues, fluids, or carcasses from my euthanatized animals with non-TTU researchers.

NOTE: This section **ONLY APPLIES** to animals which are dead prior to collecting the tissues, fluid, or carcasses. Any collection of tissues or fluids from animals which are alive requires specific protocol approval for the collection of tissues or fluids.

LITERATURE CITED

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Appendix 9: Blank IACUC/OB Protocol Form

Please provide complete citations of all literature cited to support this protocol.

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RESEARCH PERSONNEL INFORMATION

This person has been previously added to a **New Animal Use Form**: ☐ Yes ☐ No

Animal Questions or Concerns: ☐ This is a Primary Contact Person ☐ This is a Secondary Contact Person

Name: E-mail Address:

Add Personnel

Amend Personnel

I am requesting that the following person be added to this approved protocol: ☐ Yes ☐ No

Animal Questions or Concerns: ☐ This is a Primary Contact Person ☐ This is a Secondary Contact Person

Name (First, Last): E-mail Address:

Dept / Div: Day Phone #: Cell #:

Highest Degree Earned: ☐ High School ☐ AA / AS ☐ BA / BS ☐ MA / MS ☐ Ph D / D Phil

☐ MD / DVM / VMD/ DO / DDS / RN ☐ Other (specify):

TTU Relationship (Check all that apply): ☐ Faculty ☐ Student - Graduate ☐ Student - Undergrad.

☐ Permanent Staff ☐ Temporary Staff ☐ Resident/Fellow ☐ Visiting Scientist ☐ Not Paid by TTU

Please describe any formal training received related to the use of research animals. Include the institution, approximate dates, and a brief description of the training content:

Please provide the **number of years** of practical and formal training that prepares research personnel to perform the procedures and use the techniques required in this protocol? (Please be specific.)

PRINCIPAL INVESTIGATOR AGREEMENT

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PRINCIPAL INVESTIGATOR AGREEMENT

Check each box that is applicable to confirm agreement and sign at the end of this section. The agreement may be signed electronically as part of this form or a copy may be signed manually and sent separately from an electronically submitted protocol application.

- ☐ I will conduct the project in accordance, where applicable, with the PHS Policy on Humane Care and Use of Laboratory Animals; USDA regulations (9 CFR Parts 1, 2, 3); the Federal Animal Welfare Act (7 USC 2131 et. Seq.); the *Guide for the Care and Use of Laboratory Animals;* or the *Guide for the Care and Use of Agriculture Animals*.
- ☐ I confirm that all individuals working on this protocol have been assessed for health risks and are participating in an appropriate Occupational Health & Safety Program.
- ☐ I authorize individuals listed on this application to conduct procedures involving animals and I accept responsibility for their oversight in the conduct of this proposal.
- ☐ I confirm that all individuals listed on this protocol as working with animals have completed the online Animal training or will be required to do so before being permitted to begin work with animals. Further, I certify that those individuals are properly trained, or will receive such training prior to working with animals, in all areas relevant to their assigned work with animals (e.g., biology, handling, and care of the species used; aseptic surgical methods and techniques; the concept, availability, and use of research or testing methods that limit the use of animals or minimize distress; the proper use of anesthetics, analgesics, and tranquilizers; and procedures for reporting animal welfare concerns).
- ☐ For animals held in a TTU operated facility or used on the TTU campus, I understand that in cases of necessary medical treatment, TTU veterinarians are authorized to provide any treatment required to sustain life; or if necessary, humane euthanasia to prevent distress and/or pain. I recognize that the veterinary staff will contact me as soon as possible using the emergency contact information that I provide in this application, but I understand that such contact may not always be possible prior to providing treatment or performing euthanasia.

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☐	I will notify the IACUC (IACUC@ttu.edu) regarding unanticipated outcomes of animal use; including protocol and non-protocol related disease or injury. Unanticipated outcomes are generally defined as negatively impacts to animal welfare. This encompasses all animals associated with any IACUC approved protocol.
☐	I will obtain approval from the IACUC before initiating any change in the study design or procedures by submitting a request for minor or significant change as appropriate. I understand that work performed without IACUC approval cannot be published with certification of IACUC approval and may result in federally-required reporting of non-compliance.

NOTE: Signature is not necessary when emailed from the PIs 'ttu.edu' email address.
If this project has a sponsor, then the sponsor should be listed in the 'cc' box of the email.

PI Name: PI Signature:

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Appendix 9: Blank IACUC/OB Protocol Form

Submit by Email

TEXAS TECH UNIVERSITY
Office *of the* Vice President *for* Research
Institutional Animal Care & Use Committee

Current Protocol Number(s):

Category: B C D E

PERSONNEL AMENDMENT FORM

Note: This amendment request will be approved at the administrative level.

Investigator: Department: Date:

Office Phone: Cell Phone: E-mail:

Title of Project:

Please fill out all additional information as needed.

Add Personnel to this Project

This person has been previously added to a New Animal Use Form: Yes No

Animal Questions or Concerns: This is a Primary Contact Person This is a Secondary Contact Person

Name (First, Last): E-mail Address:

Add Names

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Add Names

☐ Delete Personnel No Longer involved in this Project

	Name	Title/Position
Click to Add Names		

This EDITED form can not be saved and accessed, or submitted on your computer without downloading and installing Adobe Acrobat Pro. The required submission process is from the PI's 'ttu.edu' e-mail address (no signatures required if submitted via the PI's 'ttu.edu' e-mail address; or if a senior lab member submits from their 'ttu.edu' e-mail address and adds the PI to the e-mail as a 'cc').

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TEXAS TECH UNIVERSITY
Office *of the* Vice President *for* Research
Institutional Animal Care & Use Committee

IACUC OFFICE USE ONLY	
Protocol Number:	Date Notice Sent:
Category:	
Annual Review Year	
◉ Year 1 ○ Year 2 ○ Year 3	

Annual Review and Progress Report

NOTICE:
This protocol is due for an annual review. Submission of the annual review form is required to continue approval of this protocol. Therefore, you must submit this report to the IACUC **before your annual expiration date.**

Principal Investigator: Department:

Title of Project:

ORS routing Number:

Date of last review:

Animal(s) used in project:

Species: Common name:

Number of animals used on this project since last ARPR:

Total Number Collected/Purchased since last ARPR:

Total Number Carried Over From the Previous Year:

Total number of animals to be used in the project:

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Total Number Collected/Purchased since last ARPR:

Total Number Carried Over From the Previous Year:

Total number of animals to be used in the project:

Provide a brief Status/Progress report indicating what has been accomplished to date:

Date project started: Expected date of completion:

Is this project involving the use of live animals active?

- No
- Yes

Check applicable statements below.

- ☐ I request continuation of this protocol without change.
- ☐ I request continuation of this protocol with changes as described in detail, including personnel changes on the Protocol Amendment Form (available Downloadable IACUC Forms) which I am forwarding to IACUC@TTU.EDU
- ☐ I request termination of this protocol. I understand that in order to reinstate this study, a new protocol application must be submitted.

Submit Date 3/11/19

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☐ As Principal Investigator of this project, I certify that it conforms to all Federal, State and Institutional laws and guidelines concerning the use of live animals. The Animal Care and Use Committee will be notified of any noncompliance or departures from the approved protocol.

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Appendix 10: IACUC/OB Periodic Report

Please attached a copy of the latest facilities (including laboratory inspections) and program assessment report conducted by the IACUC/OB.

Memo

To: Dr. Joseph Heppert
Institutional Official

From: Dr. Philip N. Smith, Chair
Institutional Animal Care and Use Committee

Date: April 25, 2019

Subject: Semi-Annual Evaluation of the Texas Tech University Animal Care and Use Program and Inspection of Animal Facilities

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Herein is a report on the April 2019 semi-annual evaluation of the Texas Tech University animal use program and associated animal facilities inspections. This report is required by the Federal Animal Welfare Act and by the Texas Tech University Animal Welfare Assurance of Compliance with the Public Health Service Policy on Humane Care and Use of Laboratory Animals. This report shall be maintained by the research facility and made available to AAALAC, APHIS, and to officials of federal funding agencies for inspection and copying upon request.

Texas Tech University is registered USDA #74-R-0108 as a research facility. The Public Health Service Assurance identification is A3629-01. Texas Tech University adheres to provisions of title 9, Chapter 1, Subchapter A of the Animal Welfare Act.

- The IACUC did not identify significant departures from provisions of the Animal Welfare Act.
- A copy of the animal facilities evaluation is being forwarded to each respective Department Chairperson/supervisor as needed.

Program Review

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Appendix 10: IACUC/OB Periodic Report

The IACUC conducted its semi-annual evaluation of the Texas Tech University animal care and use program on April 19, 2019 using the *Guide for the Care and Use of Laboratory Animals* (2011 Guide) and as applicable, 9 CFR Chapter I, 2.31.

Current Exceptions to the *Guide*

The following species are currently on protocols that have provided justification for the PI to individually house these animals: mice, rats, swine, quail, dogs, cattle, sheep, and fish. Additionally, there is a protocol involving mice that has an approved exception to the *Guide* for room temperature. There are approved fluid and/or food restrictions for the following species: mice, xenopus, bats, and dog protocols. Additionally, there are dog protocols and one swine protocol that are exempted from free choice, restricted food intake. Prolonged restraint is approved in one mouse and one reptile protocol. Another protocol is approved with multiple exceptions which include cage change frequency, environmental enrichment, restricted food and water, and stress paradigm. Furthermore, there are two dog and a swine protocol that allow a radio to be used. Finally, there are two mice protocols with exemptions to environmental enrichment. All exceptions to the *Guide* and *Ag Guide* have been reviewed and approved by the IACUC.

No major programmatic deficiencies were identified.

One minor programmatic deficiency that was noted again this semiannual program review was regarding training for research investigators, instructors, technicians and students. As noted in previous reports, there exists a continued need for additional specialized training among many investigators, students, and staff. The IACUC would like to express our appreciation for providing the resources to open a Training Coordinator position. Upon completion of the hiring process for the training coordinator position, this minor deficiency will be resolved.

Animal Facilities Inspection

The IACUC conducted its semi-annual evaluation of facilities April 18-19, 2019 using the *Guide for the Care and Use of Laboratory Animals* (2011 Guide) and as applicable, 9 CFR Chapter I, 2.31.

Overall

The committee found many facilities in excellent condition, but several were in need of significant attention. Details are included below:

Minor facilities issues that needed to be addressed:

[redacted]

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The next 8 pages have been withheld pursuant to 418.181

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

In the Table below, provide room-specific information requested. For each room within this location, indicate use, including the species for animal housing rooms. *Measurement of air exchange rates and verification of relative pressure within animal housing rooms (excluding rooms housing aquatic species only) and cage washing facilities must be completed* ***within the 12 months preceding completion of this Program Description.*** Air exchange rates may be important to maintain air quality in other areas; *however, measurements may be left at the discretion of the institution*. Information may be provided in another format, providing all requested data is included. **[*Note*: Please remove the examples provided in the Table below.]**

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- Design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

Location/Building/Facility:	**Experimental Sciences Building II**
The animal facility is served by a single duct, constant volume air handler, 100% fresh air; no recirculation and has dedicated redundant (N+1) exhaust fans and a dedicated air handler. Air handler have pre-filters and HEPA filters and are replaced every three months. The air handling unit has multiple supply fans to provide fan redundancy and is backed up by laboratory air handling units in the event of a vivarium AHU outage. A building automation system regulates temperature, airflow and pressurization in individual animal rooms using zone hot water duct coils. Reheat coils fail in the last setting and are on a UPS so there is utility power and then generator power followed by UPS. Rooms can be positive or negative pressure as needed. Generally, animal rooms are negative to the corridor and the animal facility as a whole is negative to the outside corridor, except in the barrier facility where animal rooms are positive to the corridor. A building automation systems controls two steam humidifiers to maintain minimum humidifiers to the vivarium area. ESB's chilled water and steam is supplied through TTU	

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

CHACP I (Central Heating and Cooling Plant) and constantly monitored by TTU Operations Control Center. In the case of power failures or temperature alarms, the [redacted] building manager and ACS facilities manager will be notified. The Edstrom Pulse system also monitors animal rooms (temperature, humidity, lighting) as well as the automatic watering system. A generator provides power for this facility in the case of power failure.

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	PPE entry	72°F	Y	68-79°C	Y	+	15.23	6/28/19
	Imaging	72°F	Y	68-79°C	Y	+	12.95	6/28/19
	Necropsy	72°F	Y	68-79°C	Y	-	20.81	6/28/19
	Animal Holding Room (ABSL2)	72°F	Y	68-79°C	Y	-	10.68	6/28/19
	Animal Holding/Procedure (ABSL2)	72°F	Y	68-79°C	Y	-	13.98	6/28/19
	Animal Holding Room (ABSL2)	72°F	Y	68-79°C	Y	-	14.06	6/28/19
	Animal Holding Room/Procedure (ABSL-2)	72°F	Y	68-79°C	Y	-	14.67	6/28/19
	PPE entry	72°F	Y	68-79°C	Y	+	14.17	6/28/19
	Animal Holding/Procedure	72°F	Y	68-79°C	Y	-	14.23	6/28/19
	Animal Holding Room	72°F	Y	68-79°C	Y	-	14.04	6/28/19

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Animal Holding/Procedure	72°F	Y	68-79°C	Y	-	13.85	6/28/19
	Animal Holding Room	72°F	Y	68-79°C	Y	-	10.26	6/28/19
	Procedure/Surgery	72°F	Y	68-79°C	Y		20.64	6/28/19
	Procedure/Surgery	72°F	Y	68-79°C	Y		20.18	6/28/19
	Exit vestibule	72°F	Y	68-79°C	Y	+	15.83	6/28/19
	Exit vestibule	72°F	Y	68-79°C	Y	+	14.44	6/28/19
	Exit vestibule	72°F	Y	68-79°C	Y	+	15.83	6/28/19
	Exit vestibule	72°F	Y	68-79°C	Y	+	14.44	6/28/19
	Feed room	68°F	Y	60-70°C	Y			
	Bedding room	68°F	Y	68-79°C	Y			
	PPE entry	72°F	Y	68-79°C	Y	+	14.78	6/28/19
	Animal Holding room (barrier)	72°F	Y	68-79°C	Y	+	10.19	6/28/19
	Animal Holding/Procedure	72°F	Y	68-79°C	Y	+	10.19	6/28/19
	Animal Holding room (barrier)	72°F	Y	68-79°C	Y	+	10.14	6/28/19
	PPE Exit	72°F	Y	68-79°C	Y	+	14.61	6/28/19
	PPE Exit	72°F	Y	68-79°C	Y	+	14.61	6/28/19

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Quarantine	72°F	Y	68-79°C	Y	-	14.59	6/28/19

Location/Building/Facility: [redacted]

The animal facility is served by a single duct, constant volume air handler, 100% fresh air; no recirculation and has two dedicated exhaust fans and a dedicated air handler. Air handler filters are replaced every three months. Hot water duct coils provides zone temperature control. Individual room temperature is controlled via water reheat/cooling coils. Reheat coils fail in the closed position. A building automation system regulates airflow and pressurization in individual animal rooms. Rooms can be positive or negative pressure as needed. Generally, animal rooms are negative to the corridor and the animal facility as a whole is negative to the outside corridor. There is no humidity control. A backup boiler and refrigeration unit provides heating and cooling to the facility in the event that campus provided steam or chill water is lost to the building. [redacted] chilled water and steam is supplied through TTU CHACP I (Central Heating and Cooling Plant) and constantly monitored by TTU Operations Control Center. In the case of power failures or temperature alarms, the [redacted] building manager and ACS facilities manager will be notified. A generator provides power for this facility in the case of power failure.

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Corridor	70°F	N	NA	N	-	9.14	2/6/19
	Storage	71°F	Y	68-79°F	N	+	6.72	2/6/19
	Animal Holding Room-Mouse IVCs	71°F	Y	68-79°F	N	-	25.45	2/6/19

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Feed/Bedding Storage	65°F	Y	60-70°F	N	-	36.29	2/6/19
	Animal Holding Room	72°F	Y	68-79°F	N	-	70.98	2/6/19
	Animal Holding Room	72°F	Y	68-79°F	N	-	32.35	2/6/19
	Animal Holding Room (BSL-2)- Mouse IVCs	72°F	Y	68-79°F	N	-	22.57	2/6/19
	Animal Holding Room	72°F	Y	68-79°F	N	-	32.49	2/6/19
	Procedure room/Lab	72°F	Y	68-79°F	N	+	51.71	2/6/19
	Animal Holding Room-Mouse IVCs	74°F	Y	68-79°F	N	-	36.39	2/6/19
	Hall/Storage	72°F	Y	68-79°F	N	+	18.30	2/6/19
	Clean Cagewash	70°F	Y	68-79°F	N	+	15.41	2/6/19
	Dirty Cagewash	65°F	Y	68-79°F	N	-	26.90	2/6/19
	Procedure room/Lab	65°F	Y	68-79°F	N	+	44.74	2/6/19
	Procedure/Imaging	70°F	Y	68-79°F	N	+	52.50	2/6/19

Location/Building/Facility: [redacted]

The [redacted] animal facility is served by a single duct, constant volume, 100% fresh air; no recirculation and has one dedicated exhaust fans and a dedicated air handler. The filters for this unit are replaced quarterly. The air handler has heating and cooling capabilities, one heating coil

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

and one cooling coil. Each room is equipped with a thermostat and a reheat coil to control temperature in the room. Reheat coils fail in the closed position. There are no pressurization controls for this lab or heating and cooling back-up. There is no humidity control. Back-up power is provided to select plugs and lights. [redacted] chilled water and steam is supplied through TTU CHACP I (Central Heating and Cooling Plant) and constantly monitored by TTU Operations Control Center. In the case of power failures, the ACS facilities manager will be notified.

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Animal Housing Room-Mouse IVCs	70°F	N	NA	N	+	16.93	2/6/19
	Metabolic Chambers/Animal Housing Room – Mouse Conventional	70°F	N	NA	N	-	10.66	2/6/19
	Procedure Room	70°F	N	NA	N	+	11.88	2/6/19
	Feed/Bedding Storage	68°F	N	NA	N	+	9.84	2/6/19
	Animal Housing Room-Mouse IVCs	70°F	N	NA	N	-	15.28	2/6/19
	Procedure Room	70°F	N	NA	N	+	13.83	2/6/19
	Service Area	68°F	N	NA	N	+	8.65	2/6/19
	Animal Housing Room-Mouse IVCs	72°F	N	NA	N	-	12.18	2/6/19
	Animal Housing Room-Mouse IVCs	70°F	N	NA	N	-	10.58	2/6/19
	Animal Housing Room-Mouse IVCs	86°F	N	NA	N	+	16.95	2/6/19
	Storage	67°F	N	NA	N	-	24.31	2/6/19

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Cagewash	63°F	N	NA	N	-	9.59	2/6/19
[redacted]	Clean cage storage	68°F	N	NA	N	-	15.89	2/6/19

Location/Building/Facility: [redacted]

The animal area is served by two different single duct, single constant volume, 100% fresh air, no recirculating air-handling unit. Air handler #3 serves the 5th floor facility and air handler #1 serves the 6th floor facility. There is one exhaust fan in room 617. These air handlers provide cooling and the animal rooms have reheat coils in the duct work controlled by the thermostat in the room to provide the desired temperature in each room. Reheat coils fail in the last setting. Air handler filters are replaced every 3 months. The animal rooms have pressurization controls. There is no humidity control. [redacted] chilled water and steam is supplied through TTU CHACP I (Central Heating and Cooling Plant) and constantly monitored by TTU Operations Control Center. In the case of power failures, the [redacted] building manager and/or ACS facilities manager will be notified. There is no back up cooling or heating for the animal facilities and no back up power.

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Cagewash	71°F	N	NA	N	+	9.46	2/6/19
[redacted]	Feed/Bedding Storage	68°F	N	NA	N	+	4.60	2/6/19

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Procedure Area	69°F	N	NA	N	-	17.90	2/6/19
	Animal Holding Room-Mouse IVCs	72°F	N	NA	N	-	32.69	2/6/19
	Animal Holding Room-Mouse IVCs	72°F	N	NA	N	-	31.95	2/6/19
	Storage	72°F	N	NA	N	-	34.62	2/6/19
	Corridor	69°F	N	NA	N	-	12.79	2/6/19
	Procedure Room	72°F	N	NA	N	-	16.76	2/6/19
	Animal Holding Room-Mouse IVCs	72°F	N	NA	N	-	28.92	2/6/19
	Animal Holding Room-Nonvenomous Reptiles	85°F	N	NA	Y	-	19.70	2/6/19
	Animal Holding Room-Venomous Reptiles	81°F	N	NA	N	-	23.93	2/6/19
	Storage	72°F	N	NA	N	-	28.33	2/6/19
	Animal Holding Room- Rat IVCs	72°F	N	NA	N	-	32.14	2/6/19

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Location/Building/Facility: [redacted]

[redacted] animal facility is served by a single duct, constant volume, 100% fresh air, no recirculation and has one dedicated exhaust fan. The filters for this air handler are replaced quarterly. Chilled water and steam are provided by CHAP 1. This air handler provides cooling and each room has reheat coils and a thermostat to control temperatures per room. Reheat coils fail in the closed position. Each room has manually controlled negative or positive control dampers. Animal rooms are generally positive to the corridor and the animal facility is negative to the outside hallway. The surgical suite is positive to the corridor. There are two forms of backup for this animal facility. Air handler #5 has a damper that opens to provide air flow if air handler #3 is down and there is a backup refrigeration unit and backup boiler. CHAP 1 monitors all alarms. In the case of power failures or temperature alarms, the ACS facilities manager will be notified.

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Surgery	68°F	Y	60-80°F	N	+	14.96	2/6/19
	Animal Holding Room	74°F	Y	60-84°F	N	+	39.81	2/6/19
	Animal Holding Room	74°F	Y	60-90°F	N	+	17.32	2/6/19
	Animal Holding Room	72°F	Y	60-90°F	N	+	16.24	2/6/19
	Anteroom/Necropsy	68°F	Y	60-80°F	N	+	12.63	2/6/19
	Animal Holding Room	74°F	Y	60-90°F	N	+	15.08	2/6/19
	Storage and Corridor	70°F	Y	56-80°F	N	-	11.19	2/6/19
	Animal Holding Room	72°F	Y	60-87°F	N	+	14.24	2/6/19

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Location/Building/Facility: [redacted]

Bats are housed in environmentally controlled chambers to induce hibernation. The chambers are approximately 300 cfm which produces about 10 air changes per minute. Chamber temperature and humidity is controlled electronically through equipment located outside of the animal room. Fisheries is served by a single duct, constant volume air handler. Heating and cooling is provided by chill water and hot water coils. The temperature is controlled via one pneumatic thermostat located in the lab. There is no exhaust fan serving this facility. The filters to the air handler are replaced quarterly. There are no controls for positive or negative pressures in this facility. No back up power or heating and cooling is provided for this lab. TTU CHACP I (Central Heating and Cooling Plant) constantly monitors room parameters by TTU Operations Control Center. In the case of power failures or temperature alarms, the researcher and/or ACS facilities manager will be notified. A thermocouple is located within each chamber, which logs temperature and uploads via wifi. The researcher can remotely monitor temperature and will receive an alert if the chamber temperature moves outside of setpoints.

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Animal Housing Room-Bat chambers	72°F	Y	NA	Y	NA	300 cfm (10 air changes per hour)	NA

Location/Building/Facility: [redacted]

At the [redacted] the room ventilation lies between 0.75 and 1.5 cfm per pound of body mass depending upon season. These values can be used to calculate the animal capacity of the rooms in the quail facility. Room 6 is sealed except for air coming into the room from the HVAC system and air removed from the room through an exhaust fan, which removes 120 cfm directly outside the building. Using the upper value of 1.5 cfm per pound of body mass the ventilation in the room would be sufficient for a maximum body mass of 80 pounds. Adult quail average 0.44 pounds, so the room could hold 182 adult quail. Airflow through ventilating ducts is checked once per month using an anemometer when birds are present in the rooms. The building is served by two 2-ton DX split systems consisting of electric air handler, cooling coil and air cooled condensing unit. The air handlers with cooling coil are horizontal, mounted high in the rafters and run the parameter of the building. The two air cooled condensing units are located outside to the NE of the structure.

*Bell, D. D. and W. D. Weaver. 2002. Commercial Chicken Meat and Egg Production, 5th Edition, Springer-Verlag, New York, New York.

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Animal Housing Rooms	70°F	Y	< 61 and > 80°F	N	+	10.88	2/6/19
	Feed Storage	65°F	N	< 61 and > 80°F	N	-	18.18	2/6/19
	Flight Pen	NA	NA	NA	N	NA	NA	NA

Location/Building/Facility: [redacted]

Natural ventilation via open doors and pens.

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Large Stall Barn- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Small Stall Barn- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Outdoor Paddocks- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Pasture- Animal Housing	NA	NA	NA	NA	NA	NA	NA

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Ranch Horse Barn- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Colt Pens	NA	NA	NA	NA	NA	NA	NA
	King's Quad- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Quad- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	North Barn- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	South Barn- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Goat Pen- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Cattle Pens 1-3	NA	NA	NA	NA	NA	NA	NA
	Horse Pens	NA	NA	NA	NA	NA	NA	NA

Location/Building/Facility: [redacted]

Because most livestock are in an outdoor setting, natural ventilation occurs. Shelter or shade may be provided in the form of hills, trees, structures or shade cloth.

RNB: Ventilation occurs naturally through open windows and doors. If projects are conducted during the summer, exhaust fans (n=6) are on constantly. Heaters (n=2) suspended from the ceiling are used during colder temperatures.

Swine Center: Ventilation is variable with 10 to 60 air changes per hour, depending upon season. Ventilation is always 100% fresh air. Breeding/Gestation is ventilated by fans that are thermostatically controlled, according to the air temperature. Four pit exhaust fans operate at 1150 cubic feet per minute (cfm). Four side-wall exhaust fans on each wall operate at 7500 cfm. The fans are accompanied by four

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

manually-operated louvers, on the west wall. Four heaters are located in the building. Farrowing/Nursery has one pit exhaust fan per farrowing and nursery room and two heaters per room with 4 exhaust fans each. There are two winter and two summer fans per room. Sows are cooled with water drip lines (at 80°F) and a swamp cooler is located in each farrowing room. The Research barn has two summer fans operating at 4000 cfm each with two winter louvers above the ceiling and two winter fans and four summer louvers are below the ceiling. A pit fan is located below the floor. Heaters are located at each end of the farrowing wing and an evaporative cooler provides zone cooling. Growing/Finishing- the ceiling has been removed to facilitate ventilation. There is natural ventilation on the East wing (curtains that open) with six summer fans. The West wing has six summer fans and 4 winter fans. There are four unit heaters that are suspended from the ceiling in each wing, two at each end. Each wing has six 6,000 cfm summer fans in each wing, and six winter louvers, 28" X 34", that are above the ceiling. Below the ceiling, there are four 3,000 cfm winter fans and eight summer louvers, 48" X 28". Air is exhausted by the summer fans, above the ceiling, when the air exceeds a certain point. Below this point, the winter fans exhaust air below the ceiling, and air intake is above the ceiling. Below a set minimum temperature of 65°F, all wall fans are cut off. A 3350 cfm pit fan is located at the end of the plenum under the aisles of each wing. The fan continuously exhausts air from below the floor. A misting system sprays water to cool pigs when the air temperature is above 85°F.

[redacted]: This animal facility is served by two 4-ton split system. Refrigerant and gas are used to heat and cool this building. The temperature is controlled via thermostat setting. This is not a fresh air unit but has plenum return. The filters are replaced quarterly. There is no exhaust nor is it a negative or positive controlled area and has no back-up heating, cooling or electrical power. These units are not monitored by TTU CHAP 1. Temperature is controlled via an Ecobee 4, a commercial wireless smart thermostat. The thermostat has a room sensor specifically for the kennel room. Between 9:00 am and 5:00 pm, HVAC is controlled to cycle between heating and cooling to maintain between 70-75° F average temperature across the dog room and testing facility. From 5:00pm to 9:00am the next morning, only the temperature of the dog room controls the HVAC, and maintains temperatures between 72-77° F. Supplemental electric heaters are also provided/used when temperatures will drop below 50°F. Dogs normally have constant fresh air with open access between the indoor and outdoor component of their run. If temperatures drop below 30°F overnight, the door to the outside run are shut to maintain inside temperatures. Temperature is monitored 24 hours a day, 7 days a week with a SensorPush™ temperature sensor and software. Temperature and humidity are recorded every minute and logged indefinitely. Temperature notifications are set to any temperatures below 65° F and above 80°F. Alerts for humidity are set to below 10% or above 70%. If temperature or humidity falls outside of the set range, a push notification alert is sent to the PI and graduate students on their cell phones. In addition, in the case of a power failure, a back-up automated phone dialer will call the PI to indicate the power failure. Further, if temperatures are below 50°F or above 85°F, the backup dialer will also alert the PI.

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Pasture- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Outdoor Dairy Calf- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Pasture- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	North Barn- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	South Barn- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Dry paddocks- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Pasture- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Alltech pens- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Dry lot paddocks- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Feedlot pens- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Dry lot paddocks- Animal Housing	NA	NA	NA	NA	NA	NA	NA
	Finishing Barn- Animal Housing	50-77°F	N	NA	N	-	20.43-42.96	2/6/19
	West Nursery Barn- Animal Housing	64-90°F (start 85-90°F)	N	NA	N	-	26.19-55.94	2/6/19

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	East Nursery Barn- Animal Housing	64-90°F (start 85-90°F)	N	NA	N	-	19.75-37.23	2/6/19
	West Farrowing Barn- Animal Housing	50-77°F (sow) 80-100°F (piglet)	N	NA	N	-	38.25-65.98	2/6/19
	East Farrowing Barn- Animal Housing	50-77°F (sow) 80-100°F (piglet)	N	NA	N	-	17.20-23.78	2/6/19
	Gestation Barn- Animal Housing	65-70°F	N	NA	N	-	27.02-40.27	2/6/19
	Metabolism- Dog Colony Animal Housing	70-75°F 9am-5pm; 72-77°F 5pm-9am	Y	64-84°F	N	+	10.55	2/6/19
	Metabolism- Procedure room	70-75°F	N	NA	N	NA	Not measured	NA

Location/Building/Facility: [redacted]

Natural ventilation via open pens. The facility consists of four 160 ft X 326 ft outdoor pens that are 8 feet in height (minimum) of high tensile of nine gauge woven wire mesh less than 6 " in diameter. Deer are provided shelter in the form of tall grass or 3-sided structure.

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Fenced Pasture	NA	NA	NA	NA	NA	NA	NA

Location/Building/Facility: [redacted]

[redacted]- air is heated and cooled via chillers and boilers. Three, 200 ton chillers provide cooling for the building. One chiller can provide for the entire building, so backup chilling is abundant. Three boilers provide heat for the animal facilities and support space. Each lab has its own dedicated air handling unit that is fed by the chillers and boilers for heating and cooling. [redacted]-air is supplied by a commercial air handler fed by a commercial condenser unit. SensorPush™ and Home Sitter system facilitates real time updates for temperature and humidity. Notifications are sent to the PI or student if temperature falls below 61°F or rises above 81°F (SensorPush™) and falls below 45°F or rises above 85°F (Home Sitter) or if humidity falls below 30% or rises above 70%. [redacted]- "wall-pac" unit provided heating and cooling to the room. Power outages are monitored by TTU Emergency maintenance. In the case of a building power outage, facilities managers will be notified.

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Animal Housing Rooms-Fish	70°F	N	NA	N	NA	Not measured	NA
	Animal Housing Rooms-Quail	70°F	N	NA	N	+	15.71	2/6/19
	Animal Housing Rooms-Rodent	73°F	N	NA	N	+	11.88	2/6/19
	Animal Housing Rooms-Quail	70°F	Y	61-85°F	N	+	7.64	2/6/19

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Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
N/A	Outdoor Fish Housing	N/A	N	N/A	N	N/A	N/A	N/A

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Appendix 12: Aquatic Systems Summary – Part II

Please summarize water management and monitoring information programs for each animal facility, including all satellite facilities, rooms, enclosures. The following key will assist you in completing the form:

(1) List location of aquaria, including outdoor enclosures (ponds or outdoor tanks). If indoors, list building and room number. Note that all species housed at the same location and maintained via the same design and monitoring may be listed in the same row.
(2) Please indicate if embryonic (E), larval (L), juvenile (J) or Adult (A)
(3) Group tanks (ponds, outdoor tanks, multiple aquaria) are arranged as arrays with shared water supply; individual aquaria have exclusive water handling systems.
(4) Indicate water type, e.g., fresh, brackish, or marine.
(5) Indicate water pre-treatment, e.g., dechlorination, rough filters.
(6) Indicate water circulation, e.g., static, re-circulated, constant flow, or some combination of these. If applicable, indicate water exchange frequency and amount (percentage).
(7) Provide a key word for filtration employed, e.g., biological, chemical, mechanical, and type (e.g., mechanical-bead filter). A diagram may be provided showing the flow of water, filtration, source of "make-up" water and amount replaced daily.

Part I

Location (1)	Species (2)	System Design					
		Group / Individual (3)	Water Type (4)	Pre-treatment (5)	Circulation (6)	Filtration (7)	Disinfection (e.g., UV, ozone)
[redacted]	Xenopus J & A	Group	DI water	0.3 g Instant Ocean	Re-circulated	Carbon, Biofilters	White vinegar
	Xenopus J	Individual	DI water	0.3 g Instant Ocean	Static	N/A	White vinegar
	Shiners L & A	Group	Fresh	Sodium thiosulfate	Static (minimum 25% exchange per week)	Biological	N/A

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Appendix 12: Aquatic Systems Summary – Part II

Location (1)	Species (2)	System Design					
		Group / Individual (3)	Water Type (4)	Pre-treatment (5)	Circulation (6)	Filtration (7)	Disinfection (e.g., UV, ozone)
[redacted]	Zebrafish E, L, J, A	Group	Fresh	Reverse osmosis water (100%) brought up to specific water quality standards of pH, water hardness, ammonia level and alkalinity	Re-circulating (25% exchange twice weekly)	Biological, carbon, particulate filters	UV
	Fat head minnow E, L, J, A	Group	Fresh	Reverse Osmosis (50%)/Dechlorinated water (50%)	Static (25% exchange twice weekly)	Biological, mechanical	none
	Shiners E, L, A	Group	Fresh	Sodium thiosulfate	Static (minimum 25% exchange per week)	Biological	N/A

Note: Records of equipment maintenance (filter changes, UV bulb changes, probe changes, calibrations, *etc.*) should be available for review.

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Appendix 12: Aquatic Systems Summary – Part II

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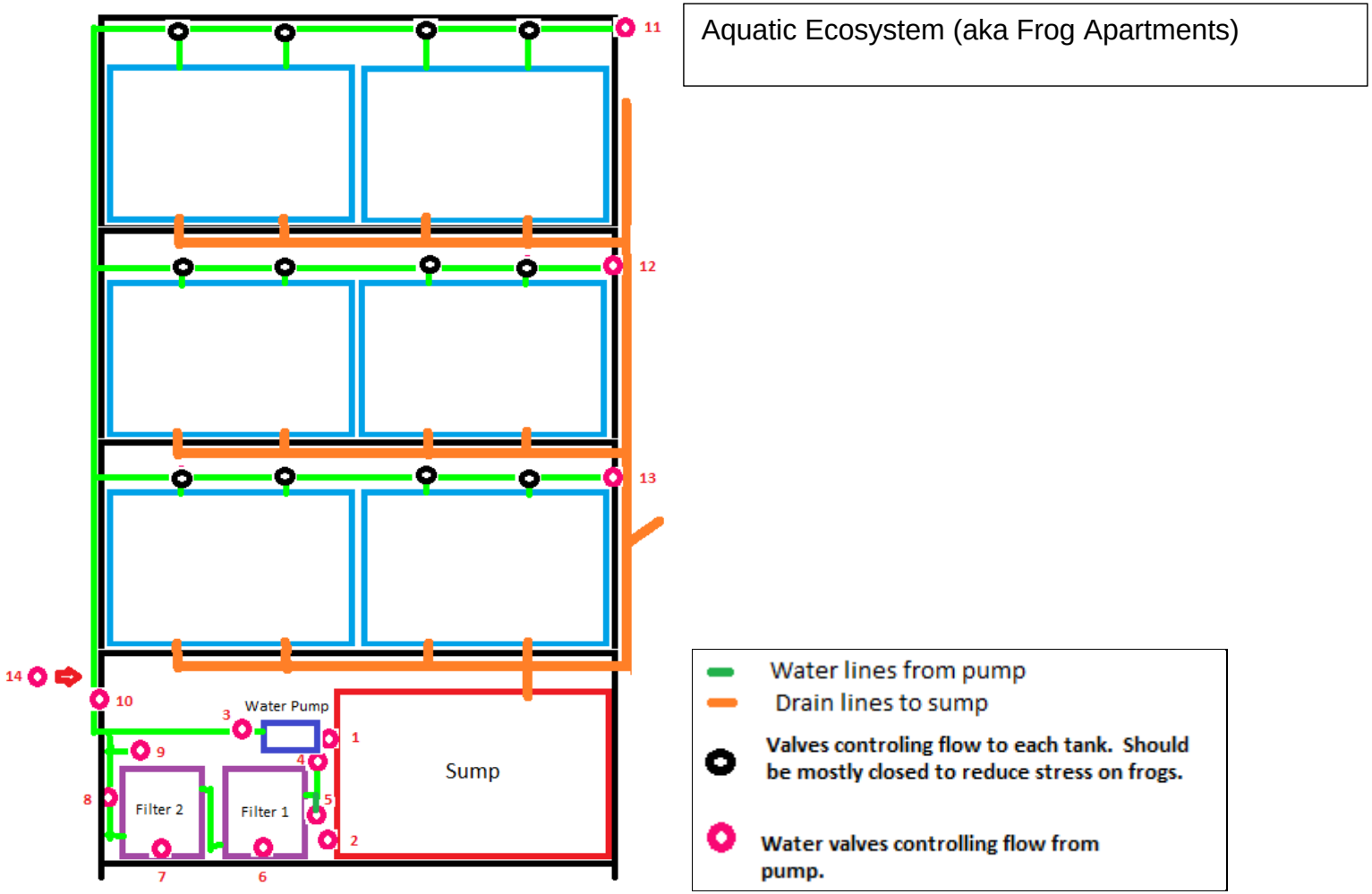
Appendix 12: Aquatic Systems Summary – Part II



The following key will assist you in completing this form:

(1) In these columns, please indicate monitoring frequency, e.g. daily, weekly, monthly or other point sampling frequency; continuous/real time, or none, if applicable. Also indicate method of control (heaters versus room HVAC, hand versus auto dosing, etc.).

(2) Indicate other parameters and their monitoring frequency, e.g., alkalinity, total hardness, conductivity, chlorine/chloramine.

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Appendix 12: Aquatic Systems Summary – Part II

Part II

Monitoring *Indicate in the boxes below the frequency of monitoring and method of control for the following parameters. (1)*									
Location (from Part I)	**Temperature**	**Salinity**	**pH**	**NH_4**	**NO_2**	**NO_3**	**Dissolved O_2**	**Total Dissolved Gases**	**Other. Please List (2):**
BSB 504	Weekly	N/A	Weekly	Weekly	Weekly	Weekly		N/A	
BSB 409	Daily	Daily	Daily	Weekly	Weekly	Weekly	Daily	N/A	
TIEHH 123 (Zebrafish)	Daily	N/A	Weekly	Weekly	Weekly	Weekly	Weekly	N/A	Total hardness-weekly
TIEHH 123 (Fat Head Minnow)	Daily	N/A	Weekly	Weekly	Weekly	Weekly	Weekly	N/A	Total hardness-weekly
TIEHH Outdoor	Daily	Daily	Daily	Weekly	Weekly	Weekly	Daily	N/A	

Note: This information may be provided in another format, provided that all requested data is included.

[Create additional rows by pressing TAB in the bottom-right box.]

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Appendix 13: Primary Enclosures and Animal Space Provisions

Please complete the Table below considering performance criteria and guiding documents (e.g., Guide, Ag Guide, ETS 123 and/or other applicable standards) used by the IACUC/OB to establish adequacy of space provided for all research animals including traditional laboratory species, agricultural animals, aquatic species, and wildlife when reviewing biomedical, field, and agricultural research studies.

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Mice	14 X 8 X 5.5 (in)	5	Guide	IVC cage. Polysulfone (blue line)
Rat	14.5 X 8 X 7 (in)	2	Guide	IVC cage. Polysulfone (blue line)
Rat	14 X 16 X 9 (in)	2	Guide	IVC cage. Polysulfone (green line)
Bat	Internal cages: 9 X 15 X 20 (in) Outer chamber: 35.5 X 33.3 X 90.1 (in)	17	Guide, AWA	Internal cages: PVC frame with mesh covering. Outer chamber: stainless steel
Rabbit	28.06 X 28.19 X 18.74 (in)	1	Guide	Rack, 3 cages. Stainless Steel; injection moulded Noryl plastic flooring and shelf
Ferrets	16.17 X 23.5 X 8.5 (in)	1	Guide	IVC cage. Polysulfone (Allentown)

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Ferrets	4 X 2 ft	3	Guide	Galvanized livestock troughs; corncob bedding; enrichment
Dog (AFS)	72 X 48 X 73 (in) 6 X 4 X 6 (ft)	1	Guide	Kennel. Aluminum Frame. Resin slated floors. Resting board
Dog (New Deal)	Indoor 94.75 X 48 X 75 (in) 8 X 4 X 6.25 (ft) Outdoor 9.5 X 4.16 X 6.25 (ft)	2	Guide	Indoor: Epoxy Floor. Aluminum Frame. Guillotine door to outdoor dirt floor, chain link fence.
Cat (AFS)	72 X 48 X 73 (in.)	3	Guide	Kennel. Aluminum Frame. Resin slated floors
PSS Greenhouse	Indoors: 172 x 9 (ft) 71 x 26.5 (ft)	3	Guide	Metal. Greenhouse glass. Free roaming.
Pig (AFS)	73 X 48 X 73 (in)	4	Guide and Ag Guide	Kennel. Aluminum Frame. Resin slated floors
Pig (AFS)	4 X 4 (ft)	2	Guide and Ag Guide	Woven-wire floor
Pig (farrowing)	7 X 2 (ft)	1	Ag Guide	Farrowing crate-woven wire floor; enclosed with metal; corrugated tin dividers

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Pig	7 X 5 (ft)	Litter	Ag Guide	Farrowing pen- woven wire floor; enclosed with metal; corrugated tin dividers
Pig	5 X 7 (ft)	8	Ag Guide	East nursery-Woven wire floors or plastic floors
Pig	5 X 5 (ft)	7	Ag Guide	West nursery- plastic floors
Pig	5 X 5 (ft) 8 (in)	9	Ag Guide	West nursery- plastic floors
Pig	7 X 12 (ft)	10	Ag Guide	Finishing- concrete slatted floors
Pig	12 X 4 (ft)	1-2	Ag Guide	Finishing sick pens- concrete slatted floors
Pig	6 ft 8 in X 2 (ft)	1	Ag Guide	Gestation crates-metal enclosure; concrete floors
Pig	9ft 6 in X 10 (ft)	5	Ag Guide	Gestation pens- concrete slatted floors

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Pig	7 ft 7 in X 27 (ft)	1	Ag Guide	Boar pens- solid concrete with metal hut
Pig (Outside Sourced Pen A & B)	196 X 110 (ft) ea	20 ea	Ag Guide	Dirt pens, 70% minimum grass cover
Cattle (Burnett Center)	9.5 X 18.33 (ft)	6	Ag Guide	Concrete, partially slotted floors
Cattle (Burnett Center)	20 X 100 (ft)	12	Ag Guide	Dirt with pipe fence
Cattle (Beef Center Cow/Calf)	90 X 120 (ft) (10 pens)	45 pairs	Ag Guide	Dirt with pipe and cable fence. 10 ft concrete apron and 90 ft concrete bunks with shade.
Cattle (Beef Center Cow/Calf)	120 X 120 (ft) (2 pens)	60 pairs	Ag Guide	Dirt with pipe and cable fence. 10 ft concrete apron with concrete bunks (4 individual feed intake nodes) with shade
Cattle (Beef Center Cow/Calf)	130 X 112 (ft) (1 pen)	65 pairs	Ag Guide	Dirt with pipe and cable fence. 10 ft concrete apron and 130 ft concrete bunks with shade
Cattle (Beef Center-S Barn)	24 X 43 (ft)	10	Ag Guide	Dirt with pipe and cable fence perimeter. Interior fence are removable metal panels. 10 ft portable feed bunk. Permanent Ritchie frost proof ball water tanks. Used for holding/sorting.

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Cattle (Beef Center-N Barn)	12 X 12 (ft) (5 pens)	2	Ag Guide	Dirt with portable metal panels. Within enclosed barn. Short term holding
Cattle (Beef Center – Hospital pen)	72 X 52 (ft) (1 pen)	32	Ag Guide	Dirt with pipe and cable fence. 64' linear concrete bunk with an 8' concrete apron and a permanent water trough. Short term holding.
Cattle (Alltech)	50 X 10 (ft) (48 pens)	5	Ag Guide	Dirt with pipe and cable fence. 10 ft concrete apron with 10 ft concrete bunk with shade.
Cattle (Biotech)	100 X 168 (ft) (1 pen)	66	Ag Guide	Dirt with pipe and cable fence. 3 sided shelter. Concrete feed bunk with apron. Linear bunk space 132 ft.
Cattle (Dairy hill)	67 X 100 (ft) (1 pen)	27	Ag Guide	Dirt with pipe and cable fence w/shelter. 54 ft concrete bunk space
Cattle (Dairy hill)	16 X 100 (ft) (8 pens)	8	Ag Guide	Dirt with pipe and cable fence w/shelter. 16 ft concrete bunks
Cattle (Beef Center- Playa lake pasture)	120 acres	60	Ag Guide	Grass pasture with hot wire fence. Long term holding
Cattle (Beef Center- SW paddock)	15 acres	15	Ag Guide	Grass pasture with net and barbed wire fence

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Cattle (Beef Center- S. Paddock)	18 acres	18	Ag Guide	Grass pasture with barbed wire fence. Short term holding
Cattle (Beef Center- SE Paddock)	16 acres	16	Ag Guide	Grass pasture with barbed wire fence. Short term holding
Cattle (Beef Center- E. Paddock- subsurface irrigation	80 acres	80	Ag Guide	Perimeter fencing is barbed wire. Separated into 12 traps with hotwire.
Cattle (Beef Center- N Paddock- BDahl w/ pivot)	65 acres	100	Ag Guide	Grass pasture with barbed wire fence. Short term calving.
Cattle (Beef Center- NE- N. of 1729)	80 acres	40	Ag Guide	Grass pasture with barbed wire fence. Long term housing

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Cattle (Beef Center- NW-N. of 1729)	180 acres	90	Ag Guide	Grass pasture with barbed wire fence. Long term housing.
Cattle (PSS Pasture 1)	5.5 acres	6	Ag Guide	Grass pasture with metal/post fence, with electric wire
Cattle (PSS Pasture 2)	5.2 acres	6	Ag Guide	Grass pasture with metal/post fence, with electric wire
Cattle (PSS Pasture 3)	5.2 acres	6	Ag Guide	Grass pasture with metal/post fence, with electric wire
Cattle (PSS Pasture 4)	5.2 acres	6	Ag Guide	Grass pasture with metal/post fence, with electric wire
Cattle (PSS Pasture 5)	5.2 acres	6	Ag Guide	Grass pasture with metal/post fence, with electric wire
Cattle (PSS Pasture 6)	5.2 acres	6	Ag Guide	Grass pasture with metal/post fence, with electric wire
Cattle (PSS Pasture NA)	11.2 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Cattle (PSS Pasture NB)	4.3 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture NC)	4.3 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture ND)	5.1 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture NE)	2.2 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture NF)	5.1 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture NG)	2.2 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture NH)	2.2 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture NI)	5.1 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Cattle (PSS Pasture NJ)	2.2 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture SA)	11.2 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture SB)	4.3 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture SC)	4.3 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture SD)	5.1 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture SE)	2.2 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture SF)	5.1 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture SG)	2.2 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Cattle (PSS Pasture SH)	5.5 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture SI)	4.3 ac	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture SJ)	4.3 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (PSS Pasture SK)	11.2 acres	6	Ag Guide	Grass pasture with metal/post fence with net wire.
Cattle (RNB)	10 X 10 (ft)	1	Ag Guide	Concrete Floors, Wooded Walls
Calf hutch-outdoor (RNB)	7.2 X 4 X 4.5 (ft) with outdoor 5.7 X 5 (ft) pen	1	Ag Guide	Commercial plastic enclosed calf hut bedded with straw. Dirt floor
Swine Quarantine (Metabolism)	28.5 X 19 (ft)	25	Ag Guide	Concrete floors, metal fence
Swine Quarantine (Metabolism)	28.5 X 9.5 (ft)	20	Ag Guide	Concrete floors, metal fence

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Sheep (north barn)	16 X 40 (ft)	10	Ag Guide	Dirt with concrete feed bunk. Automatic waterers. Partially covered pens with sheep panel and metal gates.
Sheep (south barn)	30 X 75 (ft)	25	Ag Guide	Dirt with concrete feed bunk. Automatic waterers. Partially covered pens with sheep panel and metal gates.
Sheep (NW North pens)	112 X 60 (ft)	50	Ag Guide	Dirt with galvanized sheep panel w/ metal shelter. Insulated plastic automatic waterer. Concrete feed bunk.
Sheep (NW middle pens)	112 X 64 (ft)	50	Ag Guide	Dirt with galvanized sheep panel w/ metal shelter. Insulated plastic automatic waterer. Concrete feed bunk.
Sheep (NW closest to barn)	112 X 64 (ft)	50	Ag Guide	Dirt with galvanized sheep panel w/ metal shelter. Insulated plastic automatic waterer. Concrete feed bunk.
Sheep (NE North pens)	70 X 60 (ft)	50	Ag Guide	Dirt with galvanized sheep panel w/ metal shelter. Insulated plastic automatic waterer. Concrete feed bunk.
Sheep (NE middle pens)	70 X 64 (ft)	50	Ag Guide	Dirt with galvanized sheep panel w/ metal shelter. Insulated plastic automatic waterer. Concrete feed bunk.
Sheep (NE closest to barn pens)	70 X 64 (ft)	50	Ag Guide	Dirt with galvanized sheep panel w/ metal shelter. Insulated plastic automatic waterer. Concrete feed bunk.

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Sheep (pasture)	15 acres	50	Ag Guide	Dirt with net wire perimeter fence with barbed wire on the top and underneath.
Sheep (pasture)	15 acres	100	Ag Guide	Dirt with net wire perimeter fence with barbed wire on the top and underneath.
Sheep (pasture)	5 acres	50	Ag Guide	Dirt with net wire perimeter fence with barbed wire on the top and underneath.
Sheep (pasture)	5 acres	50	Ag Guide	Dirt with net wire perimeter fence with barbed wire on the top and underneath.
Sheep (pasture)	5 acres	50	Ag Guide	Dirt with net wire perimeter fence with barbed wire on the top and underneath.
Sheep or Cattle - RNB Outdoor pens	80 X 80 (ft)	1	Ag Guide	Pipe and cable fence, grass w/shelter
Horses (TTEC) box stalls	12 X 12 (ft)	1	Ag Guide	Dirt floor bedded with shavings
Horse (TTEC Pen 0)	92 X 44 (ft)	4	Ag Guide	Pipe Fence. 11.5 X 23.5 ft metal 3-sided shed

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Horses (TTEC Pen 1)	92 X 44 (ft)	4	Ag Guide	Pipe fence. 11.5X23.5 ft metal 3-sided shed.
Horses (TTEC Pen 2)	90 X 44 (ft)	4	Ag Guide	Pipe fence; No shed
Horses (TTEC Pen 3)	40 X 44 (ft)	2	Ag Guide	Pipe fence; No shed
Horses (TTEC Pen 4)	55 X 44 (ft)	4	Ag Guide	Pipe fence; No shed
Horses (TTEC Pen 5E & 5W)	45 X 57.5 (ft) (ea. side)	3 ea side	Ag Guide	Pipe fence. 12.2X18 ft metal 1-sided shed (shed is split between the pens 5E & 5W)
Horses (TTEC Pen 6E & 6W)	45.8 X 57.5 (ft) (ea. side)	3 ea side	Ag Guide	Pipe fence. 12X21.6 ft metal 1-sided shed (shed is split between the pens 6E & 6W)
Horses (TTEC Pen 7E & 7W)	48 X 57.5 (ft) (ea. side)	3 ea side	Ag Guide	Pipe fence. 1-sided shed (shed is split between the pens 7E & 7W)
Horses (TTEC Pen 8E & 8W)	51 X 59 (ft) (ea. side)	3 ea side	Ag Guide	Pipe fence. 1-sided shed (shed is split between the pens 8E & 8W)

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Horses (TTEC Pen 9)	81 X 115 (ft)	6	Ag Guide	Pipe fence. No shed
Horses (TTEC Pen 10E & 10W)	55 X 92.5 (ft) (ea. side)	4 ea	Ag Guide	Pipe fence. 11X25 ft metal 3-sided shed split between 10E & 10W
Horses (TTEC Pen 11A)	59.6 X 40 (ft)	3	Ag Guide	Pipe fence. No shed.
Horses (TTEC Pen 11B)	58 X 44.2 (ft)	3	Ag Guide	Pipe fence. 12X17 ft metal 3-sided shed
Horses (TTEC Pen 12)	58 X 45.7 (ft)	3	Ag Guide	Pipe fence. 12X22 ft metal 3-sided shed
Horses (TTEC Pen 13)	58.6 X 50.5 (ft)	3	Ag Guide	Pipe fence. No shed
Horses (TTEC Pen 14)	58.6 X 50 (ft)	3	Ag Guide	Pipe fence. No shed.
Horses (TTEC Pen 15)	56.8 X 42 (ft)	3	Ag Guide	Pipe fence. No shed.

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Horses (TTEC Pen 16)	58.6 X 42 (ft)	3	Ag Guide	Pipe fence. No shed.
Horses (TTEC Pen 17)	58.6 X 55 (ft)	3	Ag Guide	Pipe fence. No shed.
Horses (TTEC Pen 18)	60 X 39.5 (ft)	3	Ag Guide	Pipe fence. No shed.
Horses (TTEC Pen 19)	60 X 39.5 (ft)	3	Ag Guide	Pipe fence. No shed.
Horses (TTEC Pen 20)	59.8 X 79 (ft)	3	Ag Guide	Pipe fence. No shed.
Horses (TTEC Pen 21)	180 X 79 (ft)	6	Ag Guide	Pipe fence. 3-sided shed.
Horses (TTEC Pen N1)	45 X 20 (ft)	1	Ag Guide	Pipe Fence
Horses (TTEC Pen N2)	45 X 20 (ft)	1	Ag Guide	Pipe Fence

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Horses (TTEC Pen N3)	45 X 20 (ft)	1	Ag Guide	Pipe Fence
Horses (TTEC Pen N4)	45 X 20 (ft)	1	Ag Guide	Pipe Fence
Horses (TTEC Pen N5)	45 X 20 (ft)	1	Ag Guide	Pipe Fence
Horses (TTEC Pen N6)	45 X 20 (ft)	1	Ag Guide	Pipe Fence
Horses (TTRC Quad 1)	149.8 X 49.2 (ft)	6	Ag Guide	Dirt with pipe fence and 3-sided metal shed
Horses (TTRC Quad 2)	149.8 X 44.7 (ft)	6	Ag Guide	Dirt with pipe fence and 3-sided metal shed
Horses (TTRC Quad 3)	169 X 46.8 (ft)	6	Ag Guide	Dirt with pipe fence and 3-sided metal shed
Horses (TTRC Quad 4)	169 X 43.8 (ft)	6	Ag Guide	Dirt with pipe fence and 3-sided metal shed

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Horses (TTRC King's Quad 1)	56.5 X 52 (ft)	6	Ag Guide	Dirt with metal panels; Shed row
Horses (TTRC King's Quad 2)	56.5 X 48 (ft)	6	Ag Guide	Dirt with metal panels; Shed row
Horses (TTRC King's Quad 3)	108 X 52 (ft)	6	Ag Guide	Dirt with metal panels; No shed
Horses (TTRC King's Quad 4)	108 X 48 (ft)	6	Ag Guide	Dirt with metal panels; No shed
Horses (North Rodeo barn)	12 X 30 (ft)	1	Ag Guide	Dirt w/pipe fence and shelter
Horses (South Rodeo barn)	12 X 30 (ft)	1	Ag Guide	Dirt with pipe fence and shelter
Goats (Rodeo)	23 X 10 (ft)	15	Ag Guide	Dirt w/pipe fence, covered shelter
Rodeo Cattle Pen 1	228 X 136 (ft)	50	Ag Guide	Dirt/grass with pipe fence; 1 sided shed

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Rodeo Cattle Pen 2	228 X 136 (ft)	50	Ag Guide	Dirt/grass with pipe fence; 1 sided shed
Rodeo Cattle Pen 3	228 X 136 (ft)	50	Ag Guide	Dirt/grass with pipe fence; 1 sided shed
Rodeo West Horse Pen 0	54.8 X 36 (ft)	2	Ag Guide	Dirt with metal panel; small 2-sided shed
Rodeo West Horse Pen 1	128 X 65 (ft)	3	Ag Guide	Dirt with metal panel; small 2-sided shed
Rodeo West Horse Pen 2	42 X 84 (ft)	2	Ag Guide	Dirt with metal panel; small 2-sided shed
Rodeo West Horse Pen 3	39 X 84 (ft)	2	Ag Guide	Dirt with metal panel; small 2-sided shed
Rodeo West Horse Pen 4	34 X 84 (ft)	2	Ag Guide	Dirt with metal panel; small 2-sided shed
Rodeo West Horse Pen 5	34 X 84 (ft)	2	Ag Guide	Dirt with metal panel; small 2-sided shed

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Rodeo NW Horse Pen	120.5 X 98 (ft)	3	Ag Guide	Dirt with Pipe fence ; 2-sided shed shed
Rodeo NE A & B Horse Pen	139 X 81 (ft)	3 ea side	Ag Guide	Dirt with Pipe fence; 2-side shed split
Horses (Ranch Horse)	12 X 30 (ft)	1	Ag Guide	Dirt w/pipe fence and shelter
Horse (TTEC West Pasture)	44 acres	30	Ag Guide	Pipe & cable fence with shelter
Horses (TTEC Colt Pen 1)	107 X 50 (ft)	10	Ag Guide	Dirt with pipe fence and 1-side shed row
Horses (TTEC Colt Pen 2)	107 X 50 (ft)	10	Ag Guide	Dirt with pipe fence and 1-side shed row
Horses (TTEC Colt Pen 3)	107 X 50 (ft)	10	Ag Guide	Dirt with pipe fence and 1-side shed row
Horses (TTEC Colt Pen 4)	107 X 50 (ft)	10	Ag Guide	Dirt with pipe fence and 1-side shed row

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Cattle (TTEC Cattle Pen 1)	69 X 69 (ft)	15	Ag Guide	Pipe Fence with 24X12 ft metal covered shed
Cattle (TTEC Cattle Pen 2)	69 X 69 (ft)	15	Ag Guide	Pipe Fence with 24X12 ft metal covered shed
Cattle (TTEC Cattle Pen 3)	69 X 69 (ft)	15	Ag Guide	Pipe Fence with 24X12 ft metal covered shed
Cattle (TTEC Cattle Pen 4)	99 X 69 (ft)	20	Ag Guide	Pipe Fence with 24X12 ft metal covered shed
Horses Breeding barn stall 1	25 X 25 (ft)	1	Ag Guide	Dirt floor; covered
Horse Breeding barn stall 2	25 X 19.5 (ft)	1	Ag Guide	Dirt floor; covered
Horse Breeding barn stall 3	25 X 13.5 (ft)	1	Ag Guide	Dirt floor; covered
Horse Breeding barn stall 4	25 X 13.5 (ft)	1	Ag Guide	Dirt floor; covered

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Horse Breeding barn stall 5	13.5 X 13.5 (ft) enclosed stall with 20 X 13.5 (ft) outside run	1	Ag Guide	Dirt floor; partially covered
Horse Breeding barn stall 6	13.5 X 13.5 (ft) enclosed stall with 20 X 13.5 (ft) outside run	1	Ag Guide	Dirt floor; partially covered
Horse/Cattle Holding Pen 1	28 X 30 (ft)	1 Horse	Ag Guide	Dirt with pipe fence; no shed
Horse/Cattle Holding Pen 2	28 X 30(ft)	1 Horse	Ag Guide	Dirt with pipe fence; no shed
Horse/Cattle Holding Pen 3	28 X 30 (ft)	1 Horse	Ag Guide	Dirt with pipe fence; no shed
Reptile (snake)	28 X 17 X 13.5 (in)	1		Plastic tub with latch
Reptiles (snake)	23.5 X 14 X 11.5 (in)	1		Plastic tub with latch
Reptiles (Chuckwallas)	36 X 28 X 17.5 (in)	2		Plastic with glass door

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Reptiles (snakes)	71 X 35 X 18 (in)	1		Plastic with glass door
Reptiles (snakes)	48 X 28 X 18 (in)	1		Plastic with glass door
Reptiles (rattlesnake)	14.5 X 11.75 X 17.5 (in)	1		Glass front with Plexiglas sides and top
Reptiles (rattlesnake)	23.5 X 22 X 13.5 (in)	1		Plastic with glass door
Reptiles (rattlesnake)	24.5 X 11.5 X 13 (in)	1		Plastic with glass door
Reptiles (rattlesnakes)	24 X 12 X 15.5 (in)	1		Plastic with glass door
Reptiles (rattlesnakes)	36 X 18 X 17 (in)	1		Plastic with plastic door
Reptiles (rattlesnake)	16.5 X 16.75 X 10 (in)	1		Plexiglass

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Reptile (rattlesnake)	36 X 18 X 17 (in)	3		Glass with Plexiglas lid
Zebrafish (TIEHH 123D)	2.8 L (aquaneering)	14	Guide	Polycarbonate
Zebrafish (TIEHH 123D)	6 L (aquaneering)	30	Guide	Polycarbonate
Fish (TIEHH Outdoor)	10 gallon	500 larval fish	Guide	Glass Aquarium
Fish (TIEHH Outdoor)	100 gallon	200	Guide	Fiberglass
Fish (TIEHH Outdoor)	1,200 gallon	10,000	Guide	Polyethylene, Fiberglass
Fish (fat head minnows-TIEHH 123D)	10.5 gallon	110	Guide	Glass Aquaria
Fish (fat head minnows-TIEHH 123D)	2.5 gallon	1	Guide	Glass Aquaria

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Fish (fat head minnows- TIEHH 123D)	400 gallon	300 (5 fish/L)	Guide	Circular aquaculture tanks
Fish (Bio 409)	20 gallon	50	Guide	Glass Aquarium/heaters
Fish (Bio 409, 412)	100 gallon	200	Guide	Fiberglass/heaters
Leopard Frogs (Bio 504)	24 X 48 X 24 (in)	60	Amphibians- Guidelines for the Breeding , Care and Management of Laboratory	Galvanized livestock tank with moist peat moss
Xenopus (Juveniles, young adults Bio 504)	1 gallon 2 gallons	½ gallon per adult frog depending on size	Amphibians- Guidelines for the Breeding, Care and Management of Laboratory Animals ILAR Guide	Plastic Aquaria
Xenopus (juveniles, young adults, adults Bio 504)	3 gallons 5 gallons 10 gallons 20 gallons 30 gallons 55 gallons	½ gallon per adult frog depending on size	Amphibians- Guidelines for the Breeding, Care and Management of Laboratory Animals ILAR Guide	Glass Aquaria

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Xenopus (adults Bio 504)	28 gallons	½ gallon per adult frog	Amphibians- Guidelines for the Breeding, Care and Management of Laboratory Animals ILAR Guide	Fiberglass
Xenopus (juveniles, young adults, adults Bio 504)	118 gallons	½ gallon per adult frog	Amphibians- Guidelines for the Breeding, Care and Management of Laboratory ILAR Guide	Fiberglass
Quail (Erskine)	32 X 38 X 12 (in)	0.5 ft^2/bird	Guide	Brooders- stainless steel
Quail (Erskine)	10 X 10 X 94.4 (in)	2	Guide	Welded wire mesh cage
Quail (Erskine)	120 X 19.5 X 14.5 (ft)	1,170 (2 ft^2/bird)	Guide	Flight pen- dirt floor
Quail (Erskine Huts)	63 ft^2	60	Guide	Wood and metal
Quail (Erskine-Pens)	40 ft^2	40	Guide	Wood and metal

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Appendix 13: Primary Enclosures and Animal Space Provisions

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Quail (TIEHH)	10 in X 24 (in)	2	Guide	Welded wire mesh cage
Quail (TIEHH)	32 X 38 X 12 (in)	0.5 ft^2/bird	Guide	Brooders
Quail (TIEHH)	12 X 12 X 70 (ft)	1	Guide	Flight Pen, Artificial Turf Grass, Baseball Batting Cage Set-Up
Deer	160 X 326 (ft)	20	Guide	Grass and Mesh Fencing
Chickens (AFS)	10.9 X 9 (ft)	30	Ag Guide	Metal rails with rubber mats and wood shavings

*For aquatic species, provide tank volume.
**Include descriptors such as open-topped, static microisolator, individually-ventilated cage systems (IVCS).

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Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Please describe the cleaning and disinfection methods in the Table below. Note the washing/sanitizing frequency and method for each of the following:

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Micro-environment				
Solid-bottom cages (static)	Mechanical washer; hand wash	Q 1-2 weeks	Sodium hypochlorite Potassium hydroxide Phosphoric acid	Cage Washer (180 + degrees)
Solid-bottom cages (IVC)	Mechanical washer; hand wash	Q 1-2 weeks	Sodium hypochlorite Potassium hydroxide Phosphoric acid	Cage Washer (180 + degrees)
Suspended wire-bottom or slotted floor cages	Rabbit racks/cages hand washed and sanitized weekly; Quail cages are hand washed. Dog kennels high pressure sprayer	Rabbits: weekly Quail: q 3 month Dogs: cleaned daily; sanitized q 2 weeks	Quaternary Ammonium Accelerated Hydrogen Peroxide	Hot water/Power wash
Cage lids	Mechanical washer; hand wash	Q 2 weeks	Sodium hypochlorite Potassium hydroxide Phosphoric acid	Cage Washer (180 + degrees)
Filter tops	Mechanical washer; hand wash	Q month	Sodium hypochlorite Potassium hydroxide Phosphoric acid	Cage Washer (180 + degrees)
Cage racks and shelves	Hand wash	Q 6 months	Accelerated Hydrogen Peroxide	Hot water

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Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Cage pans under suspended cages	Mechanical washer or hand washed	Rabbits: Cleaned weekly and sanitized weekly. Quail: q 3 month	Phosphoric acid Accelerated Hydrogen Peroxide	Hot water/Power wash
Play pens, floor pens, stalls, etc.	High-pressure sprayers, spot cleaning	Daily/monthly	Accelerated Hydrogen Peroxide	Manure and urine removed daily from horse stalls. Bedding replaced as needed.
Corrals for outdoor paddocks for livestock	Scraped	NA	NA	
Aquatic, amphibian, and reptile tanks and enclosures	Mechanical washer and hand wash	At least monthly	Accelerated Hydrogen Peroxide	
Feeders	Mechanical washer; hand wash	Once weekly	Sodium hypochlorite Potassium hydroxide Phosphoric acid	Cage Washer (180 + degrees)
Watering devices	Mechanical washer; hand wash	Once weekly	Sodium hypochlorite Potassium hydroxide Phosphoric acid	Cage Washer (180 + degrees)
Exercise devices and manipulanda used in environmental enrichment programs, etc.	Mechanical washer	Once weekly	Sodium hypochlorite Potassium hydroxide Phosphoric acid	Cage Washer (180 + degrees)
Transport cages	Power wash; hand wash	After use	Accelerated Hydrogen Peroxide	
Operant conditioning & recording chambers, mechanical	Spray, wipe, rinse	Rodent restrainers cleaned after use	Chlorine dioxide	

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Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
restraint devices (mouse restrainers)				
Euthanasia chambers	Spray, wipe	Cleaned/Sanitized between use	Accelerated Hydrogen Peroxide	
Macro-Environment				
Animal Housing Rooms:				
Floors	Steam hose, mop, mechanical scrubber	Twice weekly	Accelerated Hydrogen Peroxide	
Walls	Steam hose, mop, wipe	Monthly	Accelerated Hydrogen Peroxide	
Ceilings	Steam hose, wipe, mop	Monthly	Accelerated Hydrogen Peroxide	
Ducts/Pipes	Mop	Monthly	Accelerated Hydrogen Peroxide	
Fixtures	Mop	Weekly	Accelerated Hydrogen Peroxide	
Corridors:				
Floors	Mop	Twice weekly	Accelerated Hydrogen Peroxide	
Walls	Mop, Wipe	Monthly	Accelerated Hydrogen Peroxide	

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Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Ceilings	Wipe, mop	Monthly	Accelerated Hydrogen Peroxide	
Ducts/Pipes	NA	NA	Accelerated Hydrogen Peroxide	
Fixtures	Wipe	Weekly	Accelerated Hydrogen Peroxide	
Support Areas (e.g., surgery, procedure rooms, etc.); complete for each area:				
Floors	Mop	Twice weekly	Accelerated Hydrogen Peroxide	
Walls	Mop, wipe	Monthly	Accelerated Hydrogen Peroxide	
Ceilings	Wipe, mop	Monthly	Accelerated Hydrogen Peroxide	
Ducts/Pipes	NA	NA	Accelerated Hydrogen Peroxide	
Fixtures	Wipe	Weekly	Accelerated Hydrogen Peroxide	
Implements (note whether or not shared):				
Mops	Washing machine/one- use disposable	Monthly	Accelerated Hydrogen Peroxide	
Mop buckets	Hand-wash	Monthly	Accelerated Hydrogen Peroxide	
Aquaria nets	Dip	Between uses	Lab dependent	Not shared

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Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Other				
Other:				
Vehicle(s)	Hand wash; pressure wash	Livestock- after each use		
Other transport equipment (list)				

*Please provide chemical, not trade name.

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Appendix 15: Facilities and Equipment for Sanitizing Materials

In the Tables below, summarize the facilities and equipment used to sanitize animal related equipment (tunnel washer, bottle washer, rack washer, bulk autoclave, hand-washing area, bedding dispensing unit, *etc.*). Note that some descriptions may be combined if all share identical features (e.g., all rack washers).

[*Note*: Please remove the examples provided in the Table below.]

Building	Room No.	Equipment Type	Safety Feature(s)	Methods of Monitoring Effectiveness
[redacted]	10	Rack Washer	Emergency "off" button; labeled exit door, de-energizing cord on both sides; instructional signage	180-degree hot water rinse; temperature-sensitive tape used daily with machine use; ATP-based luminescence swabs performed quarterly
	10	Cabinet Washer	Emergency "off" button	180-degree hot water rinse; temperature-sensitive tape used daily with machine use; ATP-based luminescence swabs performed quarterly
	NA	Bulk Autoclave	Emergency "off" button; Abort Cycle button	Temperature-sensitive tape; biological indicators
	09	Cabinet Washer	Emergency "off" button	180-degree hot water rinse; temperature-sensitive tape used daily with machine use; ATP-based luminescence swabs performed quarterly
	617A	Cabinet Washer	Emergency "off" button	180-degree hot water rinse; temperature-sensitive tape used daily with machine use; ATP-based luminescence swabs performed quarterly
	12E	Cabinet Washer	Emergency "off" button	180-degree hot water rinse; temperature-sensitive tape used daily with machine use; ATP-based luminescence swabs performed quarterly
	09	Hand-washing area	N/A	Hot water and Peroxigard; ATP-based luminescence swabs performed quarterly
	119E	Hand-washing area	N/A	Hot water and Peroxigard; ATP-based luminescence swabs performed quarterly

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Appendix 16: Lighting Summary

[Create additional rows by pressing TAB in the bottom-right box.]

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Appendix 16: Lighting Summary

Using the Table below, summarize the lighting system(s) for the animal housing facility(ies). For each species or holding room type, list light intensity (range), construction features (e.g., water resistance), photoperiod (light:dark) and control (e.g., automatic versus manual, phasing). For systems automatically controlling photoperiod, describe override mechanisms (including alarms, if applicable).

Location: [redacted]

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
[redacted]	300-400 lux	Recessed mounted LED, water resistant	12:12 or 14:10 (breeding)	Automatic via building management system	Manual override outside each animal holding room or computer automation.
Cage-Washing Room	Not measured	Recessed, water resistant	NA	NA	NA

Location: [redacted]

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
[redacted]	300-400 lux	Recessed mounted, water resistant	12:12	Automatic via building management system	Key switch override outside each animal holding room
Cage-Washing Room	Not measured	Recessed, water resistant	NA	NA	NA

Location: [redacted]

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
[redacted]	200-320 lux	Surface mounted, water resistant	12:12	Automatic via wall-mounted timer box	Manual override
	200-320 lux	Surface mounted, water resistant	12:12	Automatic via wall-mounted timer box	Manual override
	300-400 lux	Recessed, florescent	12:12 (on at 2 am; off at 2 pm)	Automatic via wall-mounted timer box	Manual override
	Not measured	Recessed, water resistant, florescent	NA	NA	NA

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Appendix 16: Lighting Summary

Location: [redacted]					
Room Type[a]	**Light Intensity Range**	**Lighting Fixture Construction Features[b]**	**Photo-period (hrs)[c]**	**Photoperiod and Lighting Control**	**Override Mechanisms** (if applicable)
[redacted]	200-300 lux	Surface mounted, water resistant	10:14	Automatic via wall-mounted timer box	Manual override
	200-300 lux	Surface mounted, water resistant	12:12	Automatic via wall-mounted timer box	Manual override
Cage-Washing Room	Not measured	Surface mounted, water resistant	NA	NA	NA

Location: [redacted]					
Room Type[a]	**Light Intensity Range**	**Lighting Fixture Construction Features[b]**	**Photo-period (hrs)[c]**	**Photoperiod and Lighting Control**	**Override Mechanisms** (if applicable)
[redacted] Dog/Cat/Pig/Chicken	300-400 lux	Surface mounted, water resistant, fluorescent	12:12	Automatic via wall-mounted timer box	Manual override
Surgery	300-400 lux	Recessed, water resistant, fluorescent	NA	NA	NA

Location: [redacted]					
Room Type[a]	**Light Intensity Range**	**Lighting Fixture Construction Features[b]**	**Photo-period (hrs)[c]**	**Photoperiod and Lighting Control**	**Override Mechanisms** (if applicable)
Equine Holding barns	Not measured	Incandescent and fluorescent tube	Natural	NA	NA
Equine Holding pens	Not measured	NA	Natural	NA	NA

Location: [redacted]					
Room Type[a]	**Light Intensity Range**	**Lighting Fixture Construction Features[b]**	**Photo-period (hrs)[c]**	**Photoperiod and Lighting Control**	**Override Mechanisms** (if applicable)

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Appendix 16: Lighting Summary

Animal Housing room (Bats)	Not measured (hibernation-no light cycle)	Incandescent and fluorescent tube	NA	NA	N/A

Location: [redacted]

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
Cattle and Sheep Holding pens and pastures	Not measured	NA	Natural	NA	NA

Location: [redacted]

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
Swine Holding barns	Not measured	Surface mounted, covered, Incandescent and fluorescent tube	12:12	Automatic via wall mounted timer box	Manual override

Location: [redacted]

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
Dog holding rooms	300-450 lux	Surface mounted, water resistant	12:12	Natural lighting via dog run doors; artificial light manually turned on and off	NA
Dog procedure rooms	Not measured	Surface mounted, water resistant	NA	NA	NA

Location: [redacted]

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Appendix 16: Lighting Summary

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
Cannulated Cattle-stalls	Not measured	Surface mounted, fluorescent tube	N/A	Natural lighting via windows and doors; artificial light manually turned on and off (8 am-5pm)	N/A

Location: [redacted]

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
Quail Holding rooms	300-600 lux	Surface mounted, water resistant	10:14 (non-breeding) 12:12 (breeding)	Automatic via wall-mounted timer	N/A
Flight Pen, Outdoor pens	Not measured	N/A	N/A	Natural lighting	N/A

Location: [redacted]

Room Type[a]	Light Intensity Range	Lighting Fixture Construction Features[b]	Photo-period (hrs)[c]	Photoperiod and Lighting Control	Override Mechanisms (if applicable)
[redacted]	200-300 lux	Recessed, water resistant	12:12	Automatic via wall-mounted timer	Manual override
	200-500 lux	Surface mounted, covered	12:12 14:10	Automatic via wall-mounted timer	Manual override
	200-300 lux	Surface mounted, covered	14:10	Automatic via wall-mounted timer	Manual override
	100-300 lux	Surface mounted, covered	Natural	Natural lighting via large window; Artificial lights	NA

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Appendix 16: Lighting Summary

				manually turned on and off.	
[redacted]	100-200 lux	Surface mounted; red light	12:12	Automatic via wall-mounted timer	Manual override
Cage-Washing Room	Not measured	Non-recessed sealed fluorescent lighting	NA	NA	NA

Location: [redacted]					
Room Type[a]	**Light Intensity Range**	**Lighting Fixture Construction Features[b]**	**Photo-period (hrs)[c]**	**Photoperiod and Lighting Control**	**Override Mechanisms** (if applicable)
Deer holding pens	Not measured	N/A	Natural	N/A	N/A

[a] A list of each room is not needed; group or cluster rooms by species or function
[b] Include such features as water resistance, red lighting, *etc.*
[c] Note if light cycle inverted/reversed.

Repeat Location and Table as necessary for each location, including satellite housing locations

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Appendix 16: Lighting Summary

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