

## Large Animal Laboratory Animal Skills List

*A minimum of 80% (73 of 92 skills) of the skills must be mastered. Skills must be cross-referenced in your case logs. Some skills may require more than one corresponding case references. A maximum of 5 skills can be referenced in species not covered in this species category. Mastery is defined as to be able to perform a task consistently and competently without being coached or directed no less than 4 times. Mastery requires having performed the task in a wide variety of patients and situations.*

### Husbandry Requirements

	<b>Skill</b>	<b>Case Log Number(s)</b>	<b>DVM or VTS Signature</b>
1.	Ability to recognize and identify different species of swine, small and large ruminants commonly used as research models.		
2.	Mastery of husbandry requirements for the most common swine, small and large ruminant species including, but not limited to nutritional requirements, caging/housing, substrate, temperatures, humidity, lighting, grooming, bathing, foraging, enrichment, etc.		
3.	Expertise in the application of husbandry requirements in the research setting to maximize patient care, disease control and comfort.		
4.	Proficiency in the education of research staff in the proper care of individual species.		
5.	Understanding and use of various enrichment techniques for a minimum of two species classified within this skills category.		
6.	Understand the zoonotic disease risks for a minimum of two species classified within this skills category.		
7.	Proper storage of animal feed.		

### General Nursing

	<b>Skill</b>	<b>Case Log Number(s)</b>	<b>DVM or VTS Signature</b>
8.	Perform a comprehensive physical exam: identify normal/abnormal eyes/ears/nares/oral, heart/lung sounds, pain assessment, body condition score, hydration status for purposes of study candidacy and health evaluation.		
9.	Recognize signs of respiratory failure and shock for a minimum of two species classified within this skills category.		
10.	Accurately and efficiently triage patients presenting for emergent conditions, recognize adverse effects related to a research procedure or chemical catalyst.		
11.	In association with other medical team members, administer CPR (following VECCS RECOVER guidelines), evaluate effectiveness, and troubleshoot therapy.		
12.	Thorough knowledge of substances that are being used in research protocol and their potential negative side-effects		
13.	Efficient and accurate calculation of drug doses, solutions, and IV fluid rates for mammals species.		
14.	Demonstrate thorough knowledge of metric conversions.		
15.	Mastery of venipuncture in thoracic limb vessels in healthy, sick, and/or debilitated animals. Cases should describe the thoracic limb vessel used.		
16.	Mastery of venipuncture in pelvic limb vessels in healthy, sick, and/or debilitated animals. Cases should describe the pelvic limb vessel used.		
17.	Mastery of venipuncture in tail vessels in healthy, sick, and/or debilitated		

	animals.		
18.	Mastery of jugular or peripheral IV catheter placement in a variety of sites in healthy sick, and/or debilitated animals.		
19.	Mastery of surgical cut down techniques for vascular access.		
20.	Set up and maintain an IV fluid pump and syringe pump and be able to troubleshoot equipment malfunction.		
21.	Mastery of various methods of centesis (cysto, percutaneous, thora and abdominal). A minimum of two techniques must be referenced.		
22.	General knowledge of the reproduction system and cycles for a minimum of two species for research and breeding purposes.		
23.	Proper placement and/or maintenance of a rumen tube.		
24.	Ability to safely handle and restrain different species with minimal stress to the animal and describe methods. A minimum of two species should be reflected in the case logs.		
25.	Set up and perform non-invasive or invasive blood pressure monitoring, evaluate blood pressure status, and troubleshoot equipment malfunction.		
26.	Set up and monitor heart rate and rhythm with ECG monitoring, recognize normal and abnormal tracings, and troubleshoot equipment malfunction.		
27.	Set up a pulse oximeter, evaluate oxygen status, understand its limitations and troubleshoot equipment malfunction.		
28.	Administration of fluids and medications via various parenteral administration sites (IM, SC, IV, IP). A minimum of three administration routes must be references and described.		

### Anesthesia/Analgesia

	<b>SKILL</b>	<b>Case Log Number(s)</b>	<b>DVM or VTS Signature</b>
29.	Assign appropriate ASA status after reviewing patient history, PE, and diagnostic results in collaboration with a veterinarian for at least two different species.		
30.	In collaboration with a veterinarian, determine appropriate anesthetic and peri-anesthetic protocols to provide effective pain management and maximum anesthetic safety and effectiveness for at least two different species.		
31.	Perform local and regional nerve blocks. Describe the type and technique for at least two types of local or regional nerve blocks.		
32.	Evaluate the effects of common pre-anesthetic, induction, and maintenance drugs with protocol rational and potential variable to the research.		
33.	Evaluate and respond to adverse reactions to and/or complications from pre-anesthetic, induction, and maintenance medications.		
34.	Implement appropriate pre-oxygenation technique and know rationale.		
35.	Mastery of endotracheal intubation and tube placement with regards to size, length, safe technique, and when to use cuffed vs. non-cuffed tubes in routine and emergent situations in two different species.		
36.	Thorough knowledge of the risks associated with intubation and the appropriate steps to avoid these risks in ruminants.		
37.	Set up a capnograph end-tidal CO2 monitor, evaluate ventilation status, and troubleshoot equipment malfunction.		
38.	Set up a continuous respiratory rate monitor, evaluate respiratory rate status, and troubleshoot equipment malfunction.		
39.	Perform manual intermittent positive pressure ventilation with an		

	anesthesia breathing bag and evaluate its effectiveness.		
40.	Set up ventilator, calculate appropriate tidal volume and respiratory rate, and troubleshoot machine as needed.		
41.	Set up and monitor temperature (esophageal, rectal, external), evaluate patient status, and troubleshoot machine malfunction.		
42.	Implement techniques to prevent hypothermia/hyperthermia and resolve these issues by safely and effectively using devices such as warm air blankets, circulating water blankets, IV fluid warmers, radiant heating devices, and incubators pre and post surgically.		
43.	Monitor and evaluate patient status and anesthetic depth using established protocol parameters such as outward involuntary physical response (i.e. jaw tone, palpebral reflex, eye position), blood pressure, ECG, pulse oximetry, heart rate, respiratory rate, and ventilation status for at least two different species.		
44.	Administer and evaluate the effects of IV fluid (crystalloid and colloid) therapy during anesthesia.		
45.	Ability to assess appropriate extubation time with regard to various species, (such as reptiles versus ferrets), regurgitation/aspiration, and emergence from anesthesia.		
46.	Describe ventilation management for a bloated animal.		
47.	Set up, maintain, and troubleshoot a rebreathing system		
48.	Set up, maintain, and troubleshoot an anesthesia machine (oxygen tank, vaporizer, CO2 absorbent, scavenger system)		
49.	Describe appropriate eye care for anesthetized large animals.		
50.	Set up, maintain, and troubleshoot a waste gas scavenging system.		
51.	Proficiency in administration of enteral medications using a dose syringe, balling gun, and/or stomach tube.		
52.	Appropriately place padding for large animal surgical procedures		

### Surgical Nursing

	Skill	Case Log Number(s)	DVM or VTS Signature
53.	Mastery of the unique and varied individual surgical nursing requirements for at least two different species, such as positioning with special holding devices and protocol requirements.		
54.	Extensive knowledge of and ability to set up necessary equipment and supplies for a variety of surgeries (i.e. reproductive tract, GI tract, ophthalmic, orthopedic, soft tissue, rigid and flexible endoscopy, laparoscopy/coeleoscopy) for at least two different species and three different surgery types must be reflected in the case logs.		
55.	Coordinate the process of preparation, safe use, and maintenance of suction equipment and electrocautery.		
56.	Coordinate the process of preparation and positioning of patients for a variety of surgical procedures (i.e. reproductive tract, GI tract, ophthalmic, orthopedic, soft tissue, rigid and flexible endoscopy, laparoscopy/coeleoscopy) for at least two different species and three different surgery types must be reflected in the case logs.		
57.	Coordinate pre and post-operative care of surgical patients keeping in mind best husbandry practices.		
58.	Mastery of the care and maintenance of surgical instruments.		
59.	Mastery of proper surgical sterilization procedures (autoclave, ethylene oxide, glutaraldehyde, etc.).		

**Laboratory**

	<b>Skill</b>	<b>Case Log Number(s)</b>	<b>Vet or VTS Signature</b>
60.	Demonstrate the ability to perform at least 2 different in-house clotting tests (BMBT, ACT, Platelet evaluation, PT, APTT).		
61.	Properly collect, handle, and submit cytology and samples for laboratory evaluation.		
62.	Properly collect, handle, and submit samples for bacterial and fungal culturing.		
63.	Properly collect, handle, and submit samples for histopathology.		
64.	Ability to perform a gross necropsy for a minimum of two species and collect tissue samples per project protocol.		
65.	Ability to assess best euthanasia technique for preservation of tissues for research samples and understand the AVMA recognized methods of humane euthanasia for at least two different species.		
66.	Demonstrate the ability to obtain samples for tests such as, but not limited to, CBC, clinical chemistries, PCR, serology, and virology. This includes: appropriate fasting protocols, correct timing of sample collection, and correct sample collection and handling.		

**Diagnostic Imaging**

	<b>Skill</b>	<b>Case Log Number(s)</b>	<b>DVM or VTS Signature</b>
67.	Use fluoroscopy or radiograph machines for general body scans of areas of interest with interpretation.		
68.	Proficiency in evaluating the patient's condition (medical, surgical, behavioral) and adapting the radiographic procedures to those conditions.		
69.	Demonstrate accuracy and efficiency in positioning patients for a variety of CT or radiographic studies (thorax, abdomen, spine, skull, extremity, pelvis, dental)		
70.	Accurate and consistent evaluation and modification of fluoroscopic or radiographic technique.		
71.	Perform and/or demonstrate the ability to set up and assist in contrast studies (i.e. GI studies, double contrast, cystograms, myelograms) including the set up of necessary equipment, patient preparation, and administration of contrast media.		
72.	Ability to utilize, troubleshoot, and manipulate image/technique using digital radiology		
73.	Demonstrate the ability to set up, maintain equipment, and assist with or perform ultrasonography.		

**Dentistry**

	<b>Skill</b>	<b>Case Log Number(s)</b>	<b>DVM or VTS Signature</b>
74.	Thorough knowledge of dental anatomy for all species covered in the large animal species list.		

75.	Efficiently perform a comprehensive oral exam.		
76.	Readily identify oral pathology and anatomic abnormalities.		
77.	Proficiency in age determination by animal's teeth.		

### Pharmacology

	Skill	Case Log Number(s)	DVM or VTS Signature
78.	Extensive knowledge of groups of antibiotics, their mechanisms, clinically relevant side effects, and accurate evaluation of therapeutic responses.		
79.	Extensive knowledge of pain medications and their application in mammalian species, including but not limited to opioids, NSAIDS, local anesthetics.		

### Behavior

	Skill	Case Log Number(s)	DVM or VTS Signature
80.	Knowledge of basic behavioral learning concepts (i.e. punishment, positive reinforcement, rewards, operant conditioning).		
81.	Ability to recognize appropriate and inappropriate behaviors in all species mentioned in applicant case logs.		
82.	Familiarity with a variety of training tools and their uses.		
83.	Train research staff in recognizing and managing aggressive and stereotypic behavior in the research setting (i.e. use of proper restraint techniques, sedation, etc.).		

### Leadership Roles

	Skill	Case Log Number(s)	DVM or VTS Signature
84.	Supervise or assist with the creation and/or maintenance of all appropriate facility records and logs in compliance with regulatory guidelines (e.g. radiology, surgery, anesthesia, laboratory, controlled substances)		
85.	Instruct and supervise staff in the accurate recording of medical information for GLP and GLP like studies.		
86.	Establish and supervise the maintenance of appropriate sanitation and nosocomial protocols for a research veterinary facility including patient and laboratory areas.		
87.	Educate research staff in the recognition and proper handling and housing of patients with potentially infectious diseases		
88.	Proficient at developing and providing clinical skills or protocol related training in a clear and accurate manner at the level research staff understands (i.e. oral and written form including educational handouts).		
89.	Advanced knowledge of grains and forage		

