

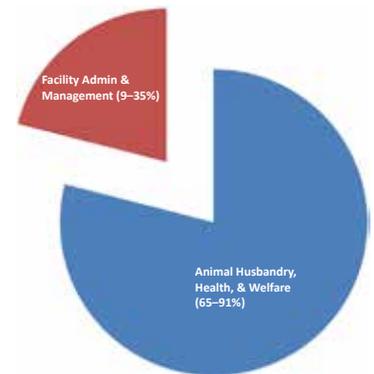
LAT Exam Content Outline

This outline is intended as both a teaching guide for instructors and a study guide for exam candidates. However, formal classroom study is not sufficient preparation for taking the certification exam. Work experience in an animal facility is also necessary for exam preparation, and in fact is one of the exam eligibility requirements. Ideally, work experience should include rotation through all areas of the animal facility to give the most opportunity for developing skills and knowledge related to a variety of species and work functions.

Exam Question Topic Domains

The chart at right shows the general topic domains covered on the LAT certification exam, plus the percentage of exam questions covering each domain. In the outline below, percentages in parentheses indicate the percentage of questions included within each of the domains of the certification exam. Topic examples listed under subdomains are not inclusive.

Reference to species-specific information requires knowledge about the animal species listed by the CRB: amphibians, birds, cats, cattle, dogs, ferrets, fish, gerbils, guinea pigs, hamsters, horses, invertebrates, mice, nonhuman primates, rabbits, rats, reptiles, sheep/goats, swine, and other less commonly used laboratory animal species. Refer to the *LAT Training Manual* for information on these species.



Animal Husbandry, Health, and Welfare (65–91%)

Identification of Animals (6–10%)

- Species recognition
- Strain identification
- Line/subline identification
- Sex differentiation
- Identification techniques and interpretation (ear notching/punching, tattooing, microchip)

Species Specifics (8–12%)

- Anatomy and physiology
- Natural habitats/environment
- Taxonomy (common names, scientific names)
- Behavior (barbering, incompatibility)
- Identification of normal vs abnormal characteristics

Breeding (5–9%)

- Housing/environmental requirements (light cycles, nestlets, nesting boxes)
- Behavior specifics (courting rituals, displays, aggression)
- Basic techniques (monogamous, harem, scheduled, cross-fostering)
- Pregnancy recognition (palpation, diagnostic tests, visual signs)
- Gestational, parturition, post-parturition, and neonatal care
- Terminology and nomenclature (knock-out, inbred, outbred)
- Complications (dystocia, prolapse, retained placenta)

Nutrition (4–8%)

- Food characteristics (form, textures, quality)
- Handling of food and water (dispensing, decontamination)
- Food/water quality control (storage, analysis, contamination, milling date)
- Animal feeding behaviors and requirements (ground feeders, upright feeders, ad lib vs rationed feeding)
- Food supplements (vitamins, minerals, administration, mill date)
- Species-specific nutritional requirements
- Water quality and delivery systems (potable water, reverse osmosis, acidification, equipment maintenance)

Husbandry Practices (9–13%)

- Environmental monitoring and control for macro- and microenvironment (temperature, humidity, ammonia, lighting)
- Caging types (squeeze, transport, metabolic)
- Caging/housing materials (polycarbonate, stainless steel)
- Species-specific housing requirements (resting boards, perches)
- Space requirements (cages, stalls, runs, number of animals per cage)
- Bedding (types, amount, quality, handling, storage)
- Special housing areas (quarantine, isolation, barrier, containment)

- Primary enclosure/bedding change frequency (regulated/nonregulated species)
- Ventilated racks and air filters
- Physical restraint/handling and transportation (techniques, equipment, precautions, food/water requirements)

Sanitation, Disease Prevention and Control (9–13%)

- Sanitization agents (cleaning chemicals, disinfectants, sterilants, concentrations)
- Decontamination methods and procedures (manual and mechanical methods, sterilization techniques)
- Pest/vermin recognition (warning signs)
- Personal hygiene (handwashing, showering)
- Aseptic techniques
- Containment and barrier techniques and facilities
- Protective equipment and clothing
- Biosecurity and disease prevention (animal inoculation, parasite control, sentinel program, pet ownership, disease transmission)

Clinical, Health and Research Procedures (10–14%)

- Medical/veterinary/scientific terminology
- Animal health considerations (signs of stress, disease, weight gain or loss, death, confirmation of death requirements)
- Treatment techniques (routes of administration for medications and euthanizing agents, euthanizing common lab rodents, pharmacology)
- Anesthesia and analgesia (induction, maintenance, monitoring)
- Diagnostic procedures (serology, hematology, microbiology, parasitology, pathology)
- Euthanasia techniques (common lab rodents, rabbits, dogs, cats, pigs, sheep, goats, cattle, horses, nonhuman primates, birds, aquatic and semiaquatic species, snakes, opossums)

Formulas and Calculations (4–8%)

- Temperature conversion (Fahrenheit, Celsius)
- Weights and measures (pounds, ounces, milliliters, millimeters, cubic centimeters)
- Dosage and dilution calculations

Animal Welfare (7–11%)

- Ethical treatment of animals
- Federal/state/local regulations, industry guidelines, institutional policies
- Environmental enrichment needs
- Public awareness (media portrayal, public perception)
- Acclimation period
- Identification of species-typical and research-induced behavior

Facility Administration and Management (9–35%)

Documentation and Record Maintenance (3–5%)

- Institutional Animal Care and Use Committee (IACUC) records
- Animal health records
- Regulatory records (USDA, PHS, FDA, GLP)
- Breeding records
- Monitoring logs/task sheets

Data Collection, Analysis and Interpretation (2–4%)

- Data entry procedures
- Data collection techniques (barcode reader, paper log, graph charts)
- Data analysis (recognition of condition changes)
- Data collection tools (computers, scanners, digital cameras)

Fiscal Management (1–3%)

- Purchasing procedures
- Quality assurance of items received

Facilities Operations and Management (2–4%)

- Equipment maintenance
- Traffic patterns (clean and dirty corridors, room care sequence)
- Procedures for reporting abnormal environmental parameters
- Inventory systems (feed, bedding, equipment)
- Rotation policies (rotating cages)
- Controlled substances handling and storage procedures
- Facility design features (sloping floors, absence of windows)

- Waste disposal (procedures and regulations, documentation)
- Security (security systems; breach prevention, response, reporting)

Occupational Health and Safety (2–4%)

- Personal protective equipment (respirators, gloves, safety glasses)
- Safety equipment and procedures for operation (fire extinguishers, alarms, bite and scratch kits, first aid)
- Personnel health surveillance/maintenance (serology banking, vaccinations, TB testing)
- Handling, storage, and disposal of hazardous waste (biohazards, chemical, radiation)
- Environmental hazards (warning signs)
- Emergency procedures (evacuation plans, hazards, contacts)
- Species-specific zoonotic risks and diseases
- Ergonomics (proper lifting technique, repetitive motion)

Employee Management and Training (1–3%)

- Organizational structure (chain of command, communication)
- Employee training programs (implementation, evaluation)
- Mentoring

Interpersonal Relations (2–4%)

- Communication (verbal, written, listening)
- Conflict resolution (grievance committee)
- Time management skills and coordination
- Institutional policies (sexual harassment, diversity, violence)

LAT Reference List

The publications listed below are referenced in the LAT test item data bank, which contains all test questions for the LAT exam. New questions are continually added to this bank, and the reference list is adjusted as needed. Check the AALAS website often for the most up-to-date list. To obtain any of the publications in this list, contact your bookstore, the publisher, or the AALAS office. Resources may be located by the ISBN number listed at the end of each reference. Government publications can be located online. Please note, however, that familiarity with the publications on this list does not guarantee a passing score on the LAT exam. Additional suggested readings are listed in the LAT manual and in the AALAS “Additional Readings for Professional Development” list. These publications should be consulted and used as sources of information and for continued education. References are not listed in order of importance.

- *LAT Training Manual*. American Association for Laboratory Animal Science. 2012
- *Public Health Service Policy on Humane Care and Use of Laboratory Animals*. Public Health Service, U.S. Department of Health and Human Services. Bethesda National Institutes of Health, Office of Laboratory Animal Welfare, MD. 2015, <http://grants.nih.gov/grants/olaw/references/phspol.htm>
- *Good Laboratory Practices for Nonclinical Laboratory Studies*. CFR 21, Part 58, Subparts A-K., <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/cfrsearch.cfm?cfrpart=58>; Code of Federal Regulations EPA 40 CFR Part 160: http://www.access.gpo.gov/nara/cfr/waisidx_04/40cfr160_04.html; and 40 CFR Part 792: http://www.access.gpo.gov/nara/cfr/waisidx_04/40cfr792_04.html
- *AVMA Guidelines for the Euthanasia of Animals: 2013 Edition*. Journal of the American Veterinary Medical Association. 2013, <https://www.avma.org/KB/Policies/Documents/euthanasia.pdf>
- Animal Welfare Regulations. Code of Federal Regulations, Title 9, Subchapter A, Parts 1-3 (9CFR 1-3), [https://www.bids.tswg.gov/TSWG/bids.nsf/D179FB382B180B5A852572B1005FA7EB/\\$file/Title9_CFR_Chpt1_SubChptA_1-4.pdf](https://www.bids.tswg.gov/TSWG/bids.nsf/D179FB382B180B5A852572B1005FA7EB/$file/Title9_CFR_Chpt1_SubChptA_1-4.pdf)

Sample Exam Questions

You may see questions like these on your certification exam. Note that each question has one correct answer and three distracters. Correct answers are listed in bold.

1. **Chemicals used to kill wild rats and mice are called:**
 - a. Exterminators
 - b. Insecticides
 - c. Rodenticides**
 - d. Traps
2. **An animal distinguished by its large cheek pouches is the:**
 - a. Hamster**
 - b. Rabbit
 - c. Gerbil
 - d. Guinea pig
3. **Malocclusion of incisors occurs most frequently in which species?**
 - a. Cat
 - b. Monkey
 - c. Dog
 - d. Rabbit**

The LAT exam covers material from the ALAT exam content outline and reference list. Certification candidates should study the training manual and references for both the ALAT and LAT exam levels. AALAS offers an LAT resource kit that contain references for the LAT exam level.