

Biomedical Research and the Veterinary Technician

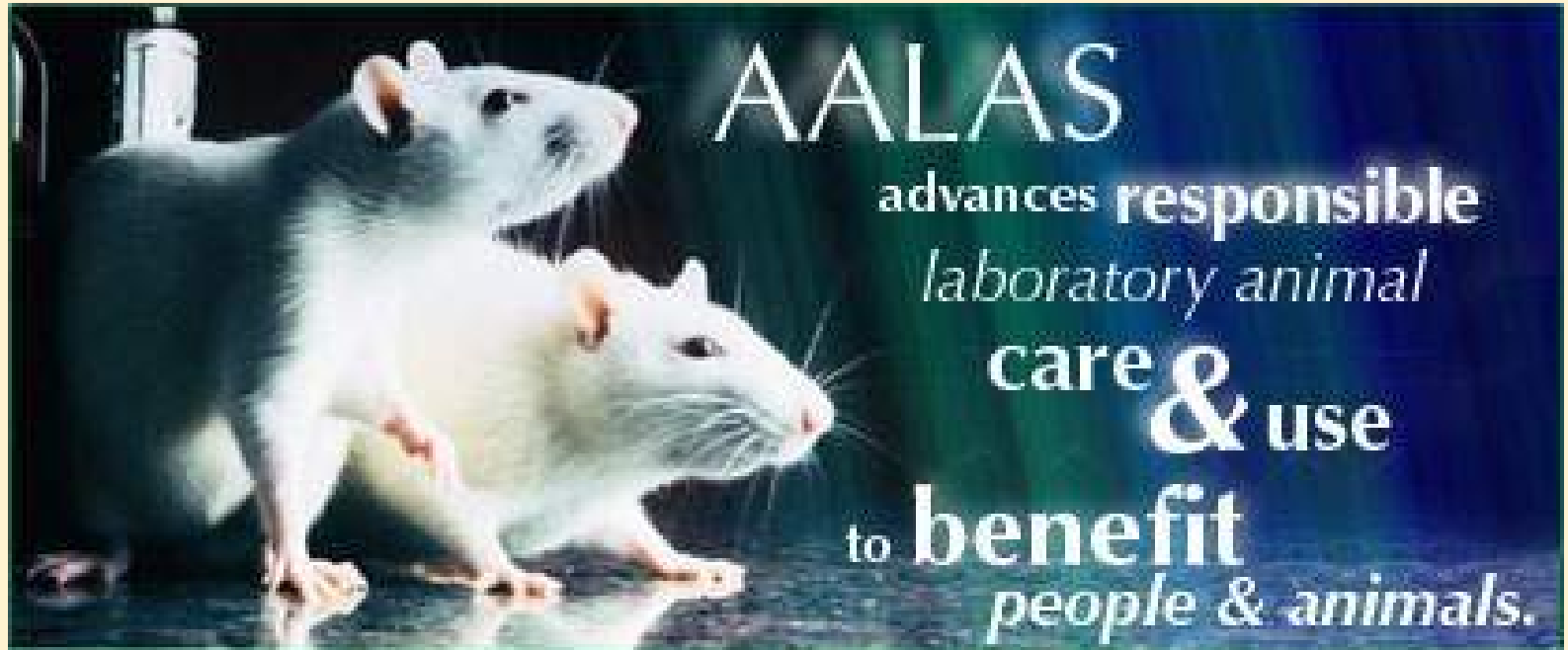


*Courtesy of the
American
Association
for
Laboratory Animal
Science*

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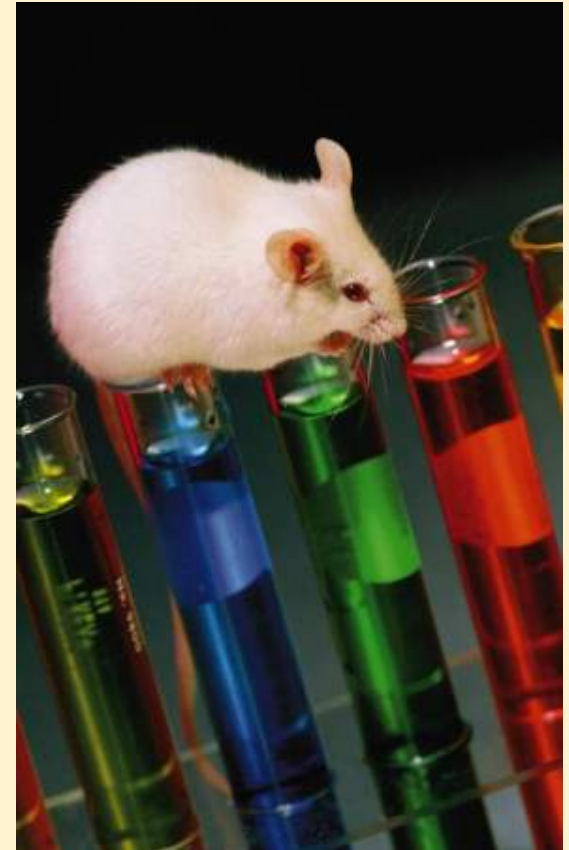


Who I Am and Who We Are ...



What *IS* Biomedical Research?

- Area of science that investigates the biological process and the causes of disease.
- Researchers use this knowledge to discover medications, surgical techniques , medical devices and therapies to prevent, treat, and cure diseases and conditions in humans and animals.



Value of Biomedical Research

- Vaccines for Small Pox, Polio, and Measles (to name only a few), open heart surgery, bone marrow transplants, the wide-range of life-saving antibiotics, are all the product of biomedical research.
- Continued research is needed to discover treatments for new diseases, like Avian Flu and Ebola, to search for **better** treatments for diseases and health conditions like cancer and asthma, and to find a **cure** for diseases like diabetes, AIDS, and cancer.



Various types of research



- In vitro
 - From the Latin meaning “in the glass”
- Ex vivo
 - From the Latin meaning “out of the living”
- In vivo
 - From the Latin meaning “in the living”
 - Pre-clinical and clinical trials are examples

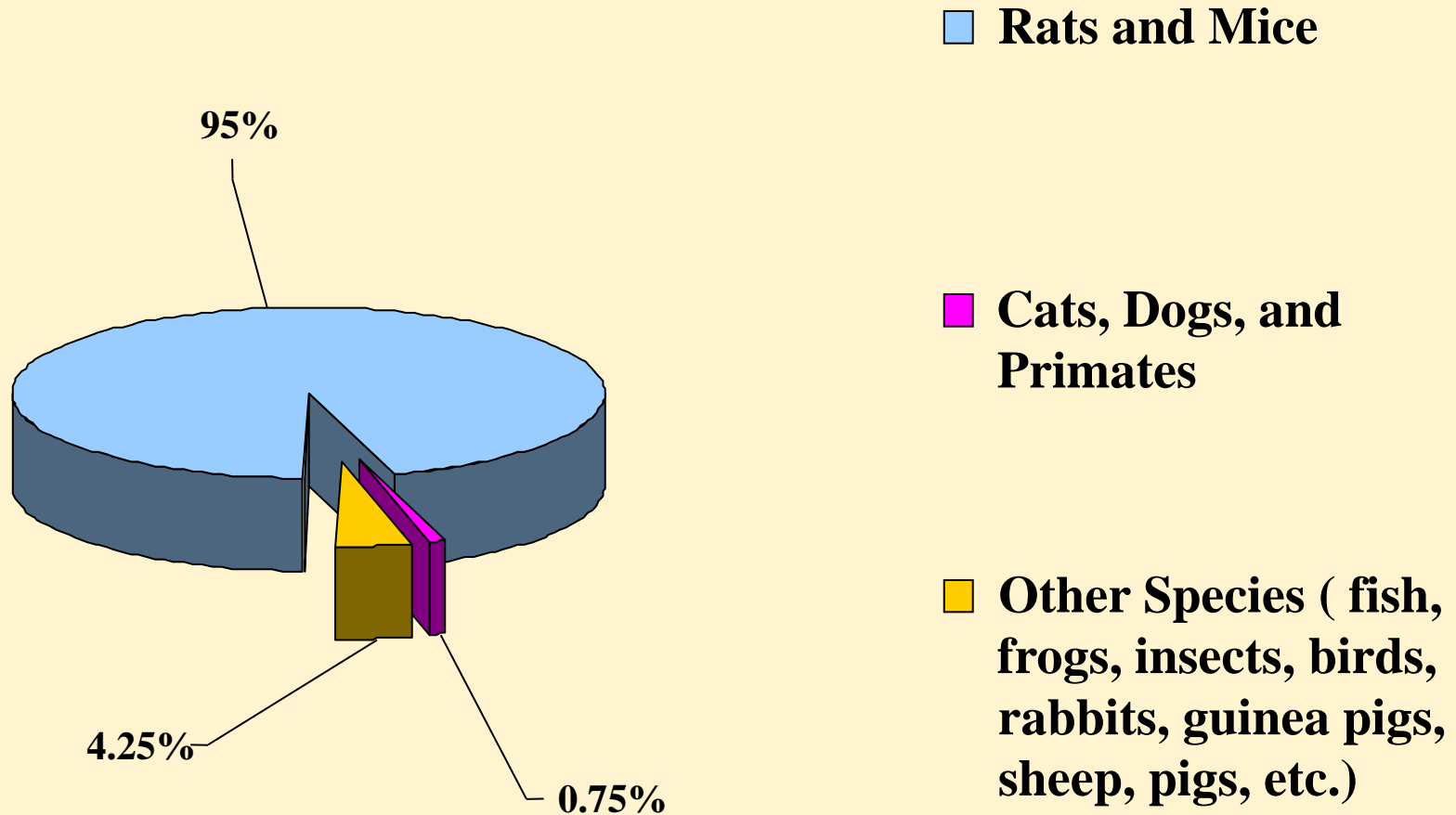


Myths About Animal Research

The animals most commonly used for research are cats, dogs, and primates.



Animals used in Research



“Other Species” Contributions

■ Pigs

- Plastic and reconstructive surgery
- Cardiovascular research
- Organ transplant techniques



■ Sheep

- Pregnancy research
- Fetal alcohol syndrome
- Vaccines for anthrax
- Joint reconstruction



■ Horses

- Diphtheria
- Tetanus (lockjaw)



■ Chinchillas

- Hearing
- Vaccine for cholera
- Sleep research

■ Ferrets

- Influenza Virus
- Reproductive research
- Canine distemper
- Toxicology Research

■ Cows

- Smallpox vaccine
- Organ transplant techniques

■ Armadillos

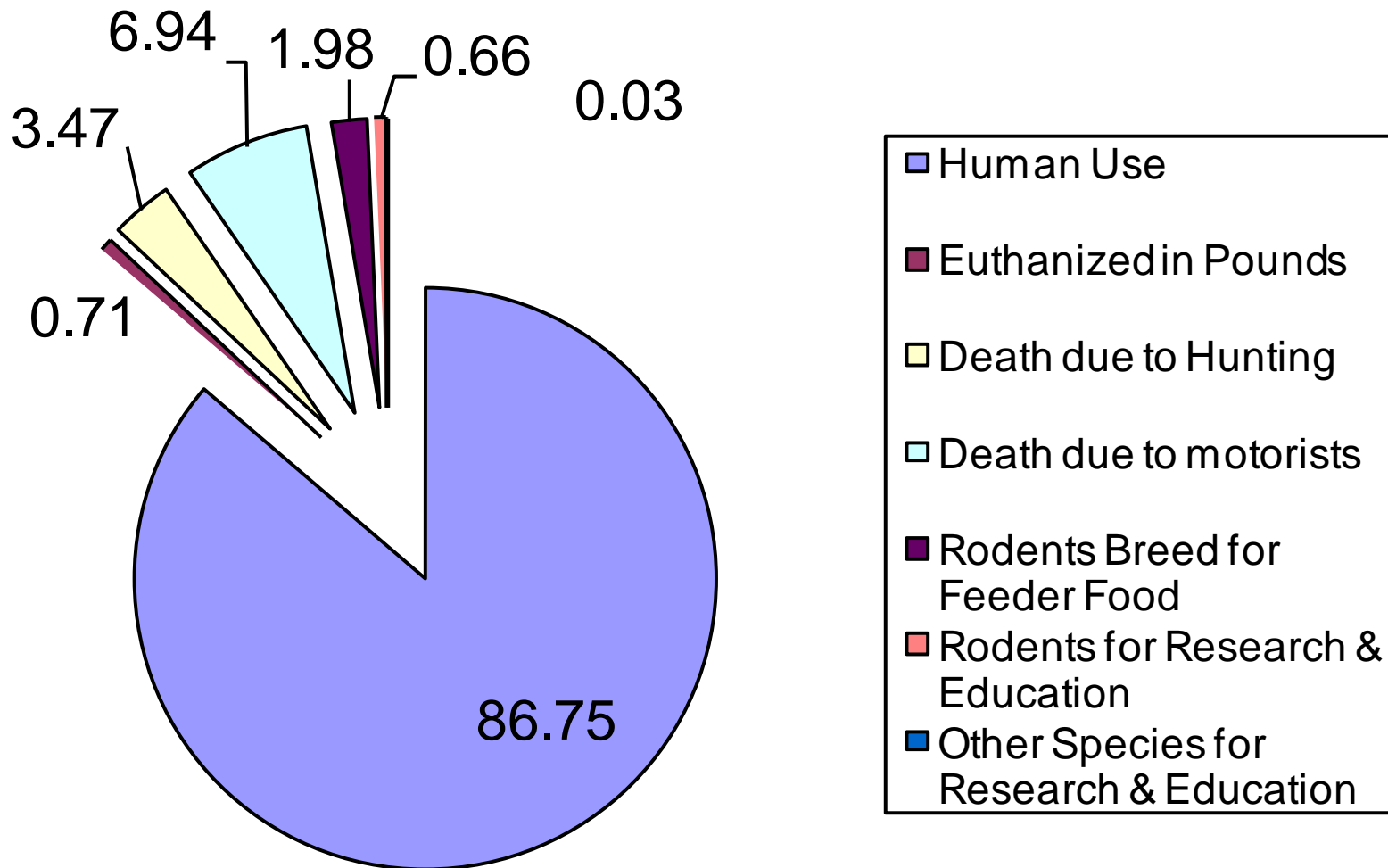
- Leprosy

■ Chickens

- Tuberculosis
- Pneumonia
- Leukemia



The Annual Numbers in Perspective



Myths About Animal Research

Most animal research is unnecessary; the same things could be learned by using computers or other non-animal methods.



The Three “Rs”

Basic principles for good laboratory animal welfare
and for a steady reduction in the need for animal
testing

REPLACE

The use of Animals
whenever possible

REDUCE

The number of
Animals needed to
the minimum

REFINE

Tests and
experiments to cause
Animals the **LEAST**
possible distress



Alternatives to Animal Research

- Alternative Methods are used *whenever* possible
- Alternatives are not *always* a substitute



Who Regulates Animal Research?

Are there enough real laws or regulations to protect research animals?



How Are Animals Protected

- The Use of Animals in Research is Covered by *More* Federal Agencies, Laws, Regulations, and Oversight than Clinical Trials Using Humans



- Federal Regulations
 - USDA Animal Welfare Regulations
 - The Animal Welfare Act (P.L. 89-544) and subsequent amendments (9 CFR, Parts 1-3)
 - Public Health Service (PHS) Policy
 - The Health Research Extension Act of 1985 (P.L. 99-158)
 - FDA The Federal Food, Drug, and Cosmetic Act of 1979
 - FDA Good Laboratory Practice (GLP) Standards (CFR 21, Part 58)



Animal Welfare Act

- Regulates the use of most mammalian and avian species in research
- Requires research facilities using regulated species to register with the USDA
- Registered facilities must have an Institutional Animal Care and Use Committee (IACUC)
- The USDA's Animal and Plant Health Inspection Service (APHIS) is responsible for administering, inspecting, and enforcing the AWA



Institutional Animal Care and Use Committee (IACUC)

- All Protocols (studies) using USDA-covered species must receive IACUC approval before they can be conducted.
- The IACUC reviews and approves or rejects protocols, and conducts facility inspections.



The FDA

- One of the nation's oldest consumer protection agencies
- Agency within the Department of Health and Human Services
- Requires ALL new drugs, medical devices, chemical compounds be tested on animals before moving on to human trials



National Institutes of Health (NIH)

- The Public Health Service's *Policy on Humane Care and Use of Laboratory Animals* requires all research funded through the NIH to conform to the Animal Welfare Act (AWA) and follow the *Guide for the Care and Use of Laboratory Animals*.
- NIH funds more than **half of all** medical research in the U.S.
- The Office of Laboratory Animal Welfare (OLAW) conducts visits to ensure compliance with regulations.



Biomedical Research Has Touched *Everyone*

- A look into your medicine cabinet, your backpack, or your desk drawer will show the important role biomedical research plays in the daily life of you and your pets.



Biomedical Research *for* Animal Health

- Medical procedure
- More than 80 medicines and vaccines
- Surgical procedures and medical devices



Why Animals Play A Critical Role in Medical Discovery

- Animals make important research subjects for a variety of reasons.
 - They are susceptible to many of the same health problems as we are.
 - Researchers can pick a species that best matches the needs of the particular research study.
 - Their shorter life cycles enable researchers to view impact throughout their whole life span or across several generations.



Animal Models and Research

- **Alzheimer's Disease**
- **Cancer**
- **Surgery and Medical Devices**
 - heart valve and artery replacement, angioplasty, organ transplantation, hip-joint replacements, etc.
- **Diabetes**
- **FIV/HIV**
 - The feline immunodeficiency virus (FIV) provides an excellent model for AIDS vaccination studies.



Environmental Enrichment



- Research animals receive many forms of environmental enrichment that also enhances their lives.
- A variety of different items can be used, such as weekly toy rotations for dogs or hanging rubber hoses for pigs to chew on.



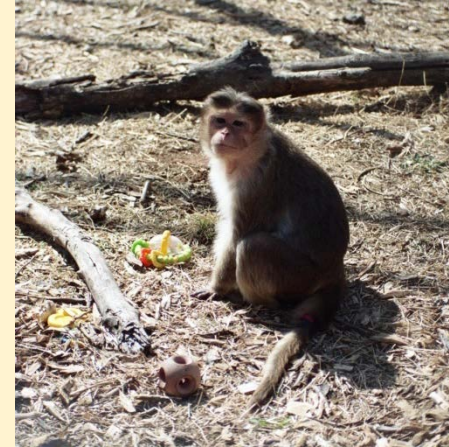
Euthanasia

- 95% of research animal models are rodents, and most research animals are euthanized after a study in order to study their tissue and/or organs. Animals whose tissues are not needed may take part in additional experiments.
- Procedures are carried out in full compliance with the American Veterinary Medical Association's *Guidelines on Humane Euthanasia*.
- Species other than rodents used in research studies may be utilized in additional studies or they may be adopted or retired.



Adoption

- In some cases, animals (mostly cats and dogs) are adopted as pets, through approved programs, or by families in the larger community once they have completed their research protocols.
- Others are cared for through their natural lives in research facilities, although they are never again used for research.
- Primates, especially chimpanzees, are often retired to sanctuaries or primate colonies.



Careers in Biomedical Research



[Watch AALAS' Video – Careers in Laboratory Animal Science](#)



AALAS Certification

- is internationally recognized as *the* professional, authoritative endorsement of an individual's level of knowledge in laboratory animal science.
 - **ALAT** = ASSISTANT LABORATORY ANIMAL TECHNICIAN
 - **LAT** = LABORATORY ANIMAL TECHNICIAN
 - **LATG** = LABORATORY ANIMAL TECHNOLOGIST
 - **CMAR** = CERTIFIED MANAGER of ANIMAL RESOURCES
- www.aalas.org for more information



Value of CVT, RVT, LVT Education in a Research Environment

- Utilize education to support veterinary and research staff:
 - Collect and process laboratory samples
 - Anesthesia support
 - Surgical support
 - Regulatory Compliance
 - Husbandry management
 - Environmental enrichment
 - Clinical care for ill animals
 - Ensure humane animal care and valid research results



Veterinary Technicians in Research Careers

- Laboratory Animal Health Technician
- Training Coordinator
- Staff Research Associate
- Supervisor/Manager
- IACUC Specialist
- Environmental Enrichment Coordinator



Laboratory Animal Health Technician

- Anesthesia monitoring
- Post operative Care
- Animal Health Surveillance
- Provide veterinary care for all animals
- Surgical Assistance
- Environmental enrichment



Training Coordinator



- Instruct animal users on humane handling and restraint techniques
- Instruct animal users on the principles of Aseptic Technique
- Instruct animal users how to appropriately anesthetize and administer analgesics



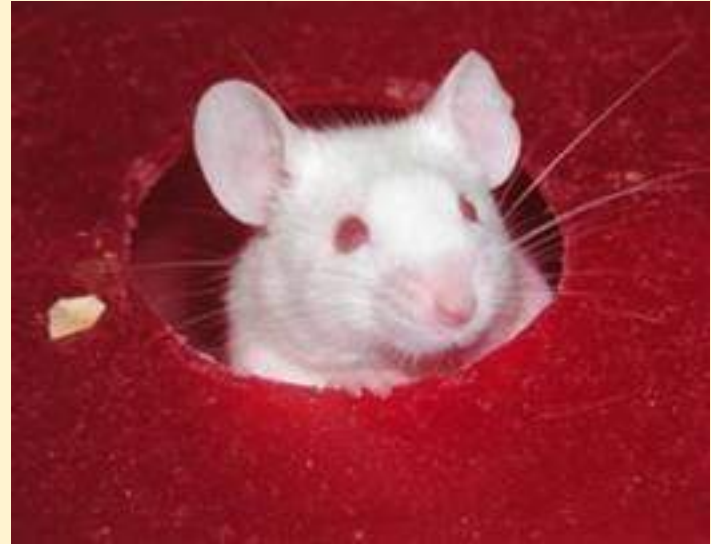
Staff Research Associate

- Perform tissue collection and histology
- Hematology collections
- Administration of test materials
- Often responsible for the evaluation of animals throughout a study protocol.
- Assist PI with Data collection and interpretation
- Assist with Grant and Animal Care and Use applications



Environmental Enrichment Technician

- Schedules enrichment items and activities for animals
- Distributes enrichment items (toys, food items) in new and different ways to stimulate the animals
- Decides which activities/items work best of each species or individual animal
- Monitors the use of the enrichment items, and monitors the behavior of the animals.



Environmental Enrichment

- This monkey is sorting through the bin looking for M&Ms and raisins.
- These ferrets are enjoying playing with the technician.



Supervisor/Manager

- Define job tasks specific to species and research project
- Job delegation based on education and expertise
- Ensure employees are properly trained and in the Occupational Health Program
- Hiring/Terminating Process
- Performance Evaluations

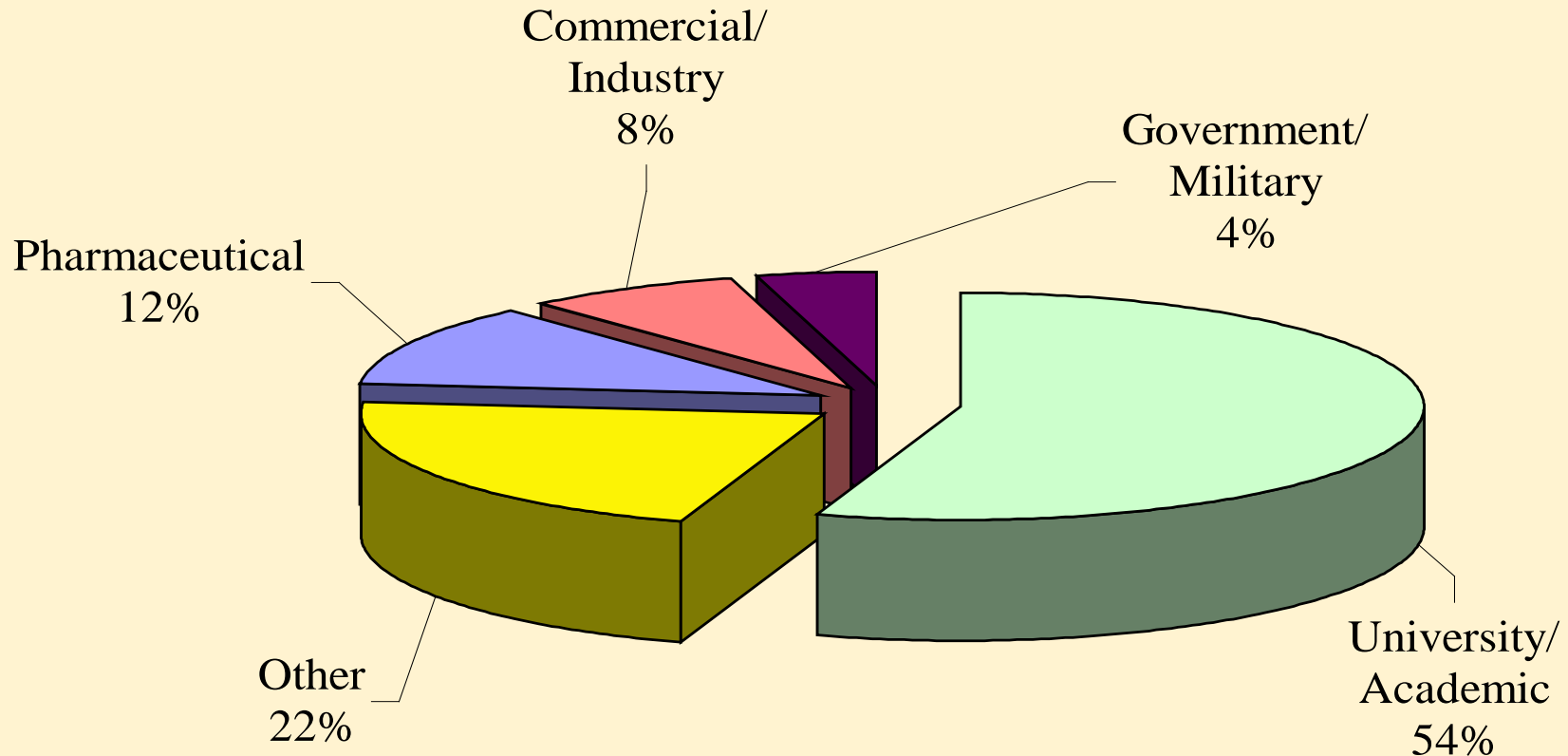


IACUC Specialist

- Review Animal Care and Use Protocols
- Inspect facilities and laboratories for safety and compliance
- Ensure Federal, State, and Local regulations are understood and followed
- Formulate Policies and Guidelines for the institution to ensure animal welfare and valid research results



Types of Facilities/ Potential Employers





Pay Scales

Research National Averages

- **\$40,823-\$77,088**
 - **\$40,823** Research Technician
 - **\$40,851** Laboratory Animal Health Technician
 - **\$54,673** Training Coordinator
 - **\$51,795** Supervisor
 - **\$77,088** Manager
 - **\$59,312** IACUC Coordinator

Private Practice National Average

- **\$26,560 - \$30,500**
 - **\$31,520** Northeast
 - **\$29,370** South
 - **\$29,060** Midwest
 - **\$29,010** West

NAVTA Survey November 2003

<http://www.navta.net/index.php>



Why become AALAS Certified?

... because it

- is useful for promotions and hiring decisions.
- gives recognition as an industry professional.
- builds confidence and improves performance.
- evaluates strengths and weaknesses.
- enhances career satisfaction.



Questions?

