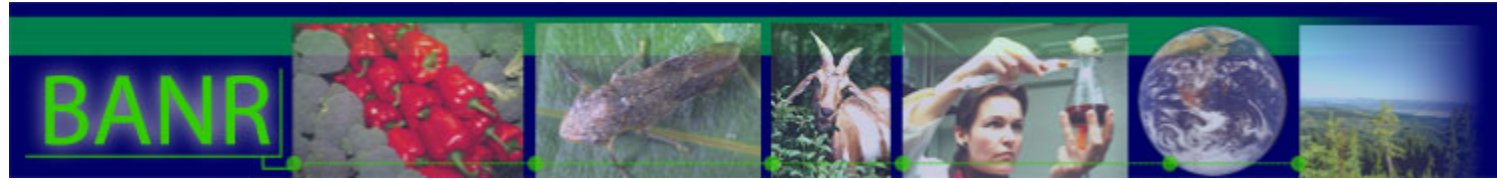




Critical Needs for Research in Veterinary Science

*NRC Committee on National Needs for
Research in Veterinary Science*



Committee Charge

To identify national needs for research in three fields of veterinary science:

- public health and food safety
- animal health
- comparative medicine



Veterinary Research

Encompasses many species:

- domestic animals: livestock and poultry
- wild animals: deer, exotic species
- companion animals: cats and dogs
- service animals: horses, dogs, marine mammals
- laboratory animals



Study Scope

- Not limited to science conducted by veterinarians
- Assess the adequacy of our national capacity, mechanisms and infrastructure to support the needed research
- Identify areas that are deficient and require attention
- Make recommendations as to how the needs can be met

**The committee will not make specific budgetary or organizational recommendations.



Committee

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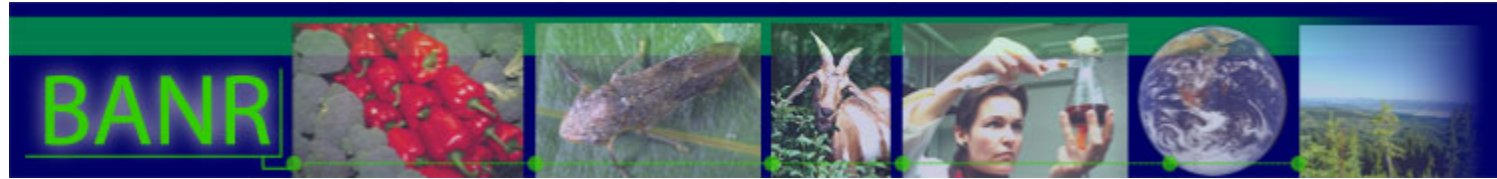
Study Process

- 5 committee meetings—including one public workshop—were held to gather information, draft report and make final deliberations
- Report reviewed by 9 external reviewers and overseen by report review coordinator
- Final product is a consensus report of the committee.



Report Structure

- Role of veterinary research in human society
- Progress and opportunities in veterinary research
- Setting and implementing an agenda for veterinary research
- Resources for veterinary research
- An assessment of current and projected resource needs for research in veterinary science



“Between animal and human medicine there is no dividing line – nor should there be. The object is different but the experience obtained constitutes the basis of all medicine.”

Rudolf Virchow (1821 – 1902)



Examples of Opportunities in Veterinary Research to Improve Animal and Human Health

Animal Health and Welfare

- Prevention and control of infectious, toxicologic and parasitic diseases of food producing animals.
- Improvement of the longevity and quality of life of companion animals.
- Determination of optimal care for laboratory animals and prevention, detection, and management of their diseases
- Prevention of population declines in wildlife species that are of interest for ecological balance, recreation, tourism, or conservation



Examples of Opportunities in Veterinary Research to Improve Animal and Human Health

Public Health and Food Safety

- Prevention of the recurrence and reduction of the effects of foodborne illnesses associated with livestock and poultry.
- Protection of food-animals from intentional introduction of biological agents or related products that can cause disease or death in humans and animals.



Examples of Opportunities in Veterinary Research to Improve Animal and Human Health

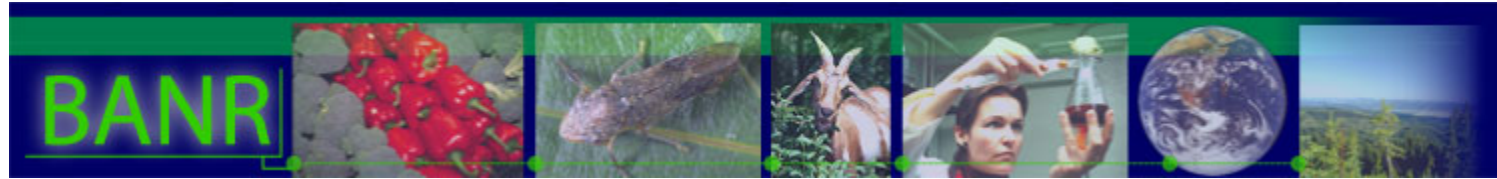
Comparative Medicine

- Improvements in human and animal health research through comparative studies in many disciplines, including hematology, immunology, vaccinology, virology, genetics, transplantation and gene therapy.
- Reduction of the risk of transmission of zoonotic and other emerging agents between wildlife, domestic animals, livestock and humans.



Some Overarching Strategies for Implementing the Research Agenda

- Implement interdisciplinary research in the broader biomedical research agenda
- Set priorities to expand our knowledge, detection, and control of infectious diseases
- Expand the study and use of bioinformatics and develop databases and other resources that would be readily accessible to the scientific community
- Quantify critical, scientifically based animal health and welfare characteristics to optimize sustainable and socially responsible food-animal production and laboratory animal research
- Expand research on the human-animal bond and the overall role of animals in society



Finding 1

Veterinary research has interfaces with human and animal health and is interdisciplinary; therefore, collaborative and interdisciplinary research is crucial in translating scientific advances from one traditional discipline to another. However, such research may be hampered by administrative barriers, cultural barriers, and lack of economic resources.



Recommendation 1

The veterinary research community should:

- facilitate and encourage collaborative research across disciplines, institutions, and agencies
- reduce administrative barriers and by nurturing and rewarding successful team-oriented investigators

NIH should consider having a veterinary liaison:

- modeled after the veterinary-medicine and public-health liaison at the Centers for Disease Control and Prevention (CDC) to help to ensure integration of veterinary and human medical research

Other federal agencies, state agencies, private foundations, and supporters of veterinary research should:

- recognize and provide long-term support for collaborative, integrated veterinary research



Finding 2

Veterinary research faces a critical personnel shortage that is not limited to biomedical sciences. Some agencies and institutions report difficulties in recruiting and retaining researchers who have the veterinary expertise needed to fulfill the organizations' roles in public health and food safety, animal health, and comparative medicine.



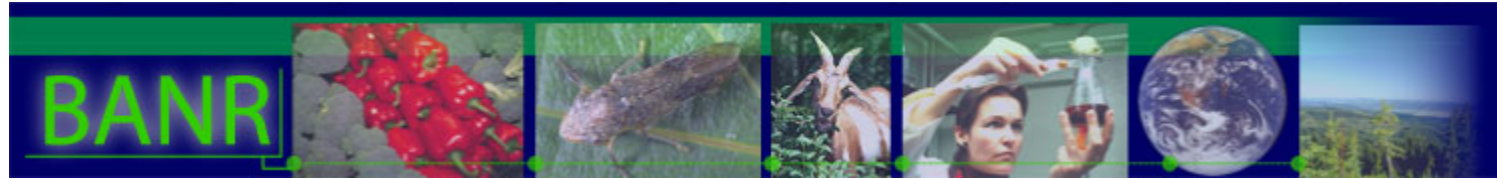
Recommendation 2

Additional veterinary researchers must be trained:

- to alleviate the scientific needs
- to meet societal needs

A debt-repayment program (similar to the NIH Clinical Research Loan Repayment Program) should be initiated:

- to address concerns about the large debt burden faced by graduates of Colleges of Veterinary Medicine
- may be modeled after NIH's Center for Cancer Research training initiative in comparative pathology and biomedical sciences
- may be modeled after the USDA's Agricultural Research Service PhD training program for veterinarians



Finding 3

Interest in research careers has been declining among veterinary students in nearly all academic disciplines. Some students are deterred by financial costs and the required extended training; others are not aware of that career option.



Recommendation 3

Veterinary Colleges should change the recruitment practices and programming for graduate and veterinary students:

- **enhance research cultures in veterinary colleges**
- **strengthen summer research programs**
- **offer more combined DVM/PhD degree paths**
- **integrate basic science into clinical curricula**

The AVMA Council on Education should:

- **strengthen the guidelines for assessment of research in regard to opportunities for research experiences for veterinary students**



Finding 4

The last major federal program to support construction of facilities for Colleges of Veterinary Medicine ended nearly 40 years ago. AAVMC has documented that new and renovated facilities are needed to train additional veterinary students to meet the demands of public practice. The committee believes that meeting the facility needs will allow training of veterinary researchers (of whom there is a critical shortage) and provide additional space for research.



Recommendation 4

AAVMC should:

- identify ways to meet CVM facility needs
 - financially
 - logistically
- mount an *extensive* outreach effort to educate state and federal policy-makers that additional facilities are critically needed to train adequate veterinary researchers



Finding 5

The USDA documented its research needs in the 1999 Strategic Planning Task Force report. Not all those needs have been met, including biocontainment facilities, which were given high priority in HSPD-9. Over the next 2-3 years, new containment laboratories may be built in academic institutions to provide additional space for veterinary research under high containment.

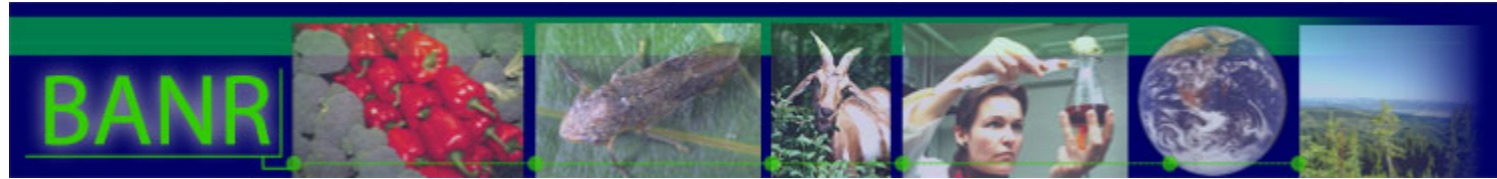


Recommendation 5

Implement previous recommendations:

- 1999 Strategic Planning Task Force on USDA Research Facilities
- HSPD-9
- Biocontainment laboratories should receive special attention

Adequacies and shortfalls in facilities—both federal and nonfederal—needed for support of veterinary research should be documented and quantified



Finding 6

Effective communication among the various entities involved in veterinary research is needed to maximize the value of studies and to leverage the resources of the relatively small veterinary research community.



Recommendation 6

American Animal Hospital Association, AAVMC, and AVMA should:

- address the need for more effective communication among the federal, university, and private sector entities involved in veterinary research
- focus attention on databases, animal health and surveillance systems, specimen collections, and other sharable research tools to support veterinary research
- organize a working task force or national workshop:
 - to devise an operating plan for developing and managing databases and collections
 - to identify methods for supporting the national databases and archives



Finding 7

Well-characterized animal colonies with known diseases have been an important resource for many remarkable studies and are imperative for integrative physiological and pathophysiological studies. Preserving the genomes of those unique model animals is critical to facilitate research in animal diseases.



Recommendation 7

NIH and USDA should:

- address the importance of engineered and spontaneous model colonies of animals
- ensure that these valuable resources are not lost:
 - cryopreservation
 - preservation of their germ plasm in tissue banks
 - transfer of their genetic mutations into smaller laboratory species
 - maintenance of the whole animals



Finding 8

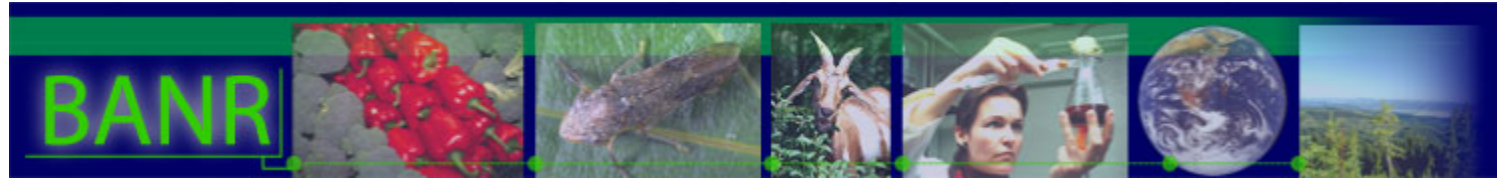
The committee identified some disciplines of veterinary research that do not have identifiable sources of financial support from government agencies—the ecology of zoonotic emerging diseases, dynamics of select agent, biodefense pathogens in wildlife, companion animal and equine research, wildlife and conservation research and, zoo-animal and exotic-pet research. Those disciplines contribute to animal health and important segments of human health research or have direct human social impact.



Recommendation 8

The veterinary research community should:

- actively engage NIH, USDA, the Department of the Interior, NSF, and other federal agencies
- urge them to recognize and address the need for financial support for veterinary research disciplines that lack identifiable sources of federal funding:
 - public health
 - animal health and welfare
 - comparative medicine



Epilogue

The impact of veterinary research extends beyond the prevention and treatment of animal diseases.

Veterinary research also :

- contributes to biomedicine through comparative medicine
- contributes to biosecurity via disease and ecosystem surveillance
- establishes social policy regarding animals
- protects the nation's agricultural economy by:
 - **protecting food animals from diseases**
 - **ensuring the safety of our food supply**



Epilogue

- Because of its small workforce and limited infrastructure and financial resources, the veterinary research community can devote little time and effort to developing and improving predictive and diagnostic tools for preventing the emergence and outbreak of disease.
- Early diagnosis or prevention can lessen the social and economic impact of diseases.
- Expanding the veterinary workforce and providing trained personnel with research resources can lead to enduring advances in animal and human health.



Acknowledgments

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