Published online first on June 20, 2008
J. Anim Sci. 1910. doi:10.2527/jas.2008-1088
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A commentary on domestic animals as dual-purpose models that benefit agricultural and biomedical research

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Abstract

Research on domestic animals (cattle, swine, sheep, goats, poultry, horses, and aquatic species) at land grant institutions is integral to improvement of the global competitiveness of U.S. animal agriculture and in resolution of complex animal and human diseases. However, dwindling federal and state budgets, years of stagnant funding from the USDA for the Competitive State Research, Education, and Extension Service National Research Initiative (CSREES-NRI) competitive grants program, significant reductions in farm animal species and numbers at land grant institutions, and declining enrollment for graduate studies in animal science are diminishing the resources necessary to conduct research on domestic species. Consequently, recruitment of scientists who use such models to conduct research relevant to animal agriculture and biomedicine at land grant institutions is in jeopardy. Concerned stakeholders have addressed this critical problem by conducting workshops, holding a series of meetings with USDA and NIH officials and developing a white paper to propose solutions to obstacles impeding use of domestic species as dual-purpose animal models for high priority problems common to agriculture and biomedicine. In addition to shortfalls in research support and human resources, overwhelming use of mouse models in biomedicine, lack of advocacy from university administrators, long-standing cultural barriers between agriculture and human medicine, inadequate grantsmanship by animal scientists, and scarcity of key reagents and resources are major roadblocks to progress. Solutions will require a large financial enhancement of USDA's competitive grants program, educational programs geared to explain how research using agricultural animals benefits both animal agriculture and human health, and development of a new "mindset" in land grant institutions that fosters greater cooperation among basic and applied researchers. Recruitment of outstanding scientists dedicated to using domestic animal models for agricultural and biomedical research, strong incentives for scientists to take advantage of training opportunities to write NIH grants, and greater NIH and USDA cooperation to sponsor use of agricultural animals as dual-purpose animal models that benefit agriculture and biomedicine will also be necessary. In conclusion, the broad diversity of animal models needed for agricultural and biomedical research is at risk unless research priorities at the land grant universities are critically evaluated and financial support for such research dramatically increased.