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Editorial: “Brain drain” and loss of resources jeopardize the continued use of domestic animals for agricultural and biomedical research¹

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Research on cattle, swine, sheep, goats, poultry, horses, and aquatic species (domestic species) at US land grant institutions is integral to maintaining an abundant, safe, affordable, and high quality supply of meat, dairy products, and eggs, which are important components of most human diets. Research on domestic species is also necessary to maintain global competitiveness of US animal agriculture and to find solutions to complex animal and human diseases. Nevertheless, a recent publication in the *Journal of Animal Science* (*JAS*; Ireland et al., 2008) documents the rapid erosion of federal and state budgets, years of inadequate and declining funding from the USDA for the National Research Initiative competitive grants program (the major agricultural competitive grants source), significant reductions in farm animal species and numbers at land grant institutions, and declining enrollment for graduate studies in the animal sciences. The article also emphasizes that as a consequence of these lost resources, recruitment of top-notch scientists who use such large-animal models to conduct research relevant to animal agriculture and biomedicine at land grant institutions is in significant jeopardy. Perhaps most notable in the *JAS* article is the documentation that despite the high annual economic value of US animal agriculture (~\$110 billion), less than 0.04% of the USDA's \$93 billion budget is currently committed to competitive funding of animal agricultural research. Disappointingly, the recently passed 2008 Farm Bill, which created a National Institute for Food and Agriculture and authorized expansion of the USDA's competitive grants program [110th CONGRESS, 2d Session, H. R. 6124, <http://frwebgate.access.gpo.gov/cgi-bin/get->

doc.cgi?dbname=110_cong_bills&docid=f:h6124eh.txt (last accessed August 11, 2008); see Sec. 7406. Agriculture and food research initiative], has no provision for increased funding to sustain high-quality research programs using domestic species. These dire findings clearly illustrate 2 key points: i) the rapid erosion of resources necessary to conduct high-quality research on domestic species, and ii) the lack of urgency within the USDA to address this crucial issue.

In addition to these major shortfalls in funding and human resources, the *JAS* article documents both the overwhelming use of mouse models in biomedicine and the declining funding for applications using domestic species, despite significant advantages of domestic species as comparative animal models in numerous areas of biomedical research (<http://www.adsbm.msu.edu/Advantages/tabid/58/Default.aspx>, last accessed August 11, 2008). Although many reasons for these problems were discussed, the article concludes that a vigorous cooperative effort is needed between the National Institutes of Health (NIH) and USDA to encourage use of agricultural animals as dual-purpose animal models that benefit both agriculture and biomedicine. This suggestion is justified and prudent, especially because, as noted in the *JAS* article, “the missions of USDA and NIH are inextricably linked because health, well-being, and fertility of domestic species underpin the availability and affordability of high-quality, nutritious food, which contributes directly to health maintenance and the prevention of chronic diseases in humans.” Hopefully, the ongoing dialog between NIH and USDA on this critical matter will result in significant, new, long-term joint funding opportunities with committed budgets.

Before publication of the *JAS* article, a relatively small nucleus of concerned stakeholders conducted workshops, held meetings with USDA and NIH officials, and developed a Web site and white paper (<http://www.adsbm.msu.edu>, last accessed August 11, 2008) to propose solutions to obstacles impeding the use of domestic species as dual-purpose animal models for

¹Although it was originally published in the *Journal of Animal Science* (<http://jas.fass.org/>), to bring attention to this important issue this editorial is being reprinted in its entirety in several journals, with permission.

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high-priority problems common to agriculture and biomedicine. However, as the *JAS* article points out, a much broader effort involving not only administrators and faculty at land grant institutions and associated organizations, but also well-informed legislators and policy makers, will be necessary to overcome the “brain drain” and continued loss of the resources needed to conduct high-quality research using domestic species. Otherwise, the sustained viability of research of ben-

efit to animal agriculture and human health using domestic animal models is at dire risk.

LITERATURE CITED

- Ireland, J. J., R. M. Roberts, G. H. Palmer, D. E. Bauman, and F. W. Bazer. 2008. A commentary on domestic animals as dual-purpose models that benefit agricultural and biomedical research. *J. Anim. Sci.* 86:2797–2805.