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Perspectives: The decline of domestic animal research in agriculture and biomedicine

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The April 24th, 2009 issue of Science contained several articles dealing with critical issues related to research with domestic animals. These papers compliment a series of recent Editorials and Commentaries (Advantages of Domestic Species as Dual-Use Models that Benefit Agricultural and Biomedical Research, 2009; Ireland et al., 2008; Randolph et al., 2007; Reynolds et al., 2009) that not only document the importance of animal sciences research to our socioeconomic well-being but also document the 20-yr decline in funding that has led to the current dire situation; including declining enrollment and fewer and fewer advanced degrees in the animal sciences. As I hope to explain in the following paragraphs, I believe we should be aware of these articles not simply for information exchange but rather to enable us to become actively engaged in these discussions. After all, we should be the principle source of science-based information on the subject.

The Policy Forum in the April 24th issue of Science by Mike Roberts and coauthors (Roberts et al., 2009) discusses the role that domestic (farm) animals have played and will continue to play in agricultural as well as biomedical research, leading to improved human health. More importantly, Roberts and coauthors document the crisis in funding that threatens continued research with domestic animals and also suggest some potential solutions to this crisis. All of the solutions they suggest require an active role for animal scientists.

The Perspectives paper by Harris Lewin (Lewin, 2009) explains how genetic profiling of domestic species is contributing important concepts in comparative and functional genomics and, in addition, how this research will contribute to improved large animal models for agricultural and biomedical research. Four additional papers in the April 24th issue of Science utilize

sophisticated genomic analyses to shed light on the origins of domestication of horses and sheep, the history of breed development in sheep and cattle, and the genes that are potentially important for production traits in cattle (Chessa et al., 2009; Ludwig et al., 2009; The Bovine Genome Sequencing and Analysis Consortium, 2009; and The Bovine HapMap Consortium, 2009).

Collectively, these papers highlight the importance of research with domestic farm animals not only to agriculture but also to biomedicine, and emphasize the critical need for enhanced funding of such research. For example, the Policy Forum by Roberts and coauthors also documents that, despite the important role of domestic animal models [“Seventeen Nobel Prize winners have used farm animals such as cattle, pigs, sheep, goats, horses, and chickens as research models” (Roberts, 2009)], funding for and training in the Animal Sciences has declined dramatically in recent decades. The authors argue that without swift and decisive action by policymakers and administrators alike, the important resources that large animal models bring to agricultural and biomedical research are in real danger of being irretrievably lost. Tellingly, however, despite a renewed focus on research and development, including major funding from the American Recovery and Reinvestment Act of 2009, the policies of the current U.S. administration have done relatively little to enhance research efforts in agriculture (Kintisch, 2009; Levine, 2009).

As animal scientists, we each must do our part to make sure our students, other educators, administrators, policymakers, and the agricultural and non-agricultural public are informed about the critical infrastructure needs that must be met in the near- and long-term to ensure the continued viability of research using domestic farm species. In this regard, the best things we can do are to make sure we are well informed and then to convey that information as often and as clearly as possible to our various constituencies.

Advantages of Domestic Species as Dual-Use Models that Benefit Agricultural and Biomedical Research. <http://www.adsbm.msu.edu/> (last accessed 04/04/09; see ‘Hot Topics <<http://www.adsbm.msu.edu/HotTopics/tqid/77/Default.aspx>>’ and ‘Updates <<http://www.adsbm.msu.edu/Updates/NewPublications/tqid/61/Default.aspx>>’ for additional recent publications related to these issues).

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Levine, A.S. 2009. “Agriculture” is not a dirty word. *Science* 324:1140.

Lewin, H.A. 2009. It’s a bull’s market. *Science* 324: 478-479.

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The Bovine Genome Sequencing and Analysis Consortium. 2009. The genome sequence of taurine cattle: A window to ruminant biology and evolution. *Science* 324: 522-527.

The Bovine HapMap Consortium. 2009. Genome-wide survey of SNP variation uncovers the genetic structure of cattle breeds. *Science* 324: 528-531.