

The USDA announces new vision for animal genomics

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A new U.S. Department of Agriculture (USDA) blueprint, published today in *Frontiers and Genetics*, will serve as a guide for research and funding in animal genomics for 2018-2027 that will facilitate genomic solutions to enable producers to meet increasing future demands for

animal products by a growing world population.

The USDA's Agricultural Research Service (ARS), the National Institute for Food and Agriculture (NIFA) and Iowa State University teamed up with federal, academic and industry scientists to publish the blueprint titled, "Genome to Phenome: Improving Animal Health, Production and Well-Being." A previous blueprint, which covered 2008-2017, met many of its goals. These accomplishments are outlined in the new blueprint. "However, several areas required further research, and new topics, based on emerging technologies, needed to be explored," said ARS National Program Leader Caird Rexroad.

The 2018-2027 blueprint states what needs to be accomplished over the next 10 years in terms of animal genomics programs that include internal funding at ARS and extramural funding at NIFA and other agencies, he added.

To develop the blueprint, ARS, NIFA and animal genomics experts convened a workshop, which was supported by Iowa State University through a grant from NIFA. During the workshop, experts in three categories—"Science to Practice," "Discovery Science" and "Infrastructure" generated new objectives for characterizing the microbiome, enhancing the use of gene editing and other biotechnologies and preserving genetic diversity. Goals in the previous plan were updated within many [genome](#) research topics.

"The blueprint identifies priorities for the kinds of research that need to be done," Rexroad said. It describes the vision, current state of the art, the research needed to advance the field, expected deliverables and partnerships needed for each animal genomics research topic.

"With the new plan, we are able to show the return on investment in the previous decade," Rexroad said. "We also identify knowledge gaps and

account for dramatic new changes in technologies when it comes to obtaining genome and DNA sequence information."

"In the last 10 years, we have been successful in implementing genomic technology in different livestock," said ARS National Program Leader Jeffrey Vallet. "The best example is the U.S. dairy cattle industry, where genomic selection has more or less doubled the rate of genetic progress. That's our example of the return on our investment."

The new [blueprint](#) addresses precision genomics—matching management to the genetic potential of the animal. This effort was successful thanks to a collaborative network of scientists from ARS, land-grant universities, genetics companies, breed associations and biotechnology companies, said NIFA National Program Leader Lakshmi Matukumalli.

"This report captures both traditional and transformational technologies to address four main goals for animal production: (1) providing nutritious food for a growing human population, (2) improving sustainability of animal agriculture, (3) increasing animal fitness and improving animal welfare and (4) meeting diverse consumer needs and choices," Matukumalli said.

More information: Caird Rexroad et al. Genome to Phenome: Improving Animal Health, Production, and Well-Being – A New USDA Blueprint for Animal Genome Research 2018–2027, *Frontiers in Genetics* (2019). [DOI: 10.3389/fgene.2019.00327](https://doi.org/10.3389/fgene.2019.00327)

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