

Animal Genome Editing

Issue Background

Scientists are exploring myriad potential uses for genome editing tools, including clinical, agricultural, and environmental applications. In basic research, genome editing is being used to determine the roles different genes play in disease and medical researchers are exploring ways to treat or prevent genetically-defined human diseases such as sickle cell disease, cystic fibrosis, congenital blindness, hemophilia, amyloidosis, and lysosomal storage disorders.

Improving the welfare of animals, their sustainable production and ability to resist or transmit disease has become an area of heightened societal interest. Independent researchers and farmers are committed globally to advancing these goals and consumers are looking for more information with respect to these practices when making food choices.

The history of selecting animals such as cows, chickens, and pigs with improved genetics has provided steady improvement to their sustainability, welfare and disease resistance. However, the benefits to the animals and to society can be greatly improved using more modern breeding techniques, such as genome editing, that continue to tap into the significant genetic potential that exists in the animal's own natural genetic code. In other words, changing the genomes of animals is not new, and ultimately, neither are the results that we can achieve. The benefit of genome editing is we can now do it in a manner that is more informed, and more precise and therefore can better serve our goals for the animal itself, as well as society at large, more readily.

Policy Position

BIO is a strong proponent of science-based, risk-proportionate regulation of biotechnology. BIO is highly supportive of the science-based position that animals with genetic changes created using genome editing tools without introducing foreign DNA, should not be treated differently than those modified through more traditional breeding methods to achieve similar results.

As scientific developments progress, BIO urges continued discussion and engagement on this topic with important stakeholders, including members of the regulatory, legal, academic, ethical, and agricultural communities.

Key Points

- ✓ Genome editing has the potential to mitigate, prevent, or cure many genetically defined diseases.
- ✓ In the pipeline are important animal welfare traits such as resistance to viruses that attack the immune systems of pigs and hornless dairy cows that will no longer need to have horns physically removed.
- ✓ Scientists are also exploring ways to use genome editing to inhibit mosquitoes' ability to transmit diseases such as malaria, dengue fever and the Zika virus.
- ✓ Research is underway to improve the genetics of cattle for hot, tropical climates so they can be more tolerant of heat, potentially boosting protein production by as much as 50 percent and thus improving people's lives in areas of extreme poverty