



Will The Public Eat Gene-Edited Farm Animals?

The CRISPR gene editing tool lets Technocrat scientists experiment with life itself and there is virtually no oversight or regulations to control them. If left unchecked they will destroy the genetic makeup of animals, humans and the entire food chain. □ TN Editor

Three cows clomped, single-file, through a chute to line up for sonograms - ultrasound “preg checks” - to reveal if they were expecting calves next summer.

“Right now. This is exciting, right this minute,” animal geneticist Alison Van Eenennaam said as she waited for a tiny blob of a fetus to materialize on a laptop screen on a recent afternoon at the Beef Barn, part of the University of California at Davis’s sprawling agricultural facilities for teaching and research.

The cows had been implanted a month and a half earlier with embryos genetically edited to grow and look like males, regardless of their biological gender.

The research project pits one of the hottest fields in biotechnology against the messy politics of gene modification.

As scientists in labs across the world create virus-resistant pigs, heat-tolerant cattle and fatter, more muscular lambs, a big question looms: Will regulation, safety concerns and public skepticism prevent these advances from becoming anything more than fascinating laboratory experiments, or will the animals transform agriculture and the food supply? So far, gene-editing tools have jump-started research worldwide, creating more than 300 pigs, cattle, sheep and goats. Now, proponents of the field say the United States is at a make-or-break moment, when government action over the next year could determine whether any gene-edited food animals make it to market.

The announcement last month that a Chinese researcher had created genetically edited human babies sparked an international furor and a moral debate. But while such research is effectively outlawed in the United States and was swiftly condemned by a group of leading researchers, Van Eenennaam and her colleagues are pushing similar techniques into the barnyard. There, such applications are far less hypothetical. But the societal consensus about how or whether they should be used - and how to prove the technology is safe for animals and people who eat them - is even less clear.

Just down the road from the Beef Barn are five bulls and a heifer, the second generation of cattle that have been gene-edited to lack horns, avoiding a grisly procedure in the dairy industry called "disbudding," when calves' horns are burned or cut off. The new gene-editing attempt is even more audacious.

For farmers seeking to maximize beef production, all-male cattle could be a win: Males gain weight more efficiently than females. For scientists, successful births would add to a menagerie of gene-edited animals that demonstrate the power of the technology beyond the lab, where their use is mostly routine and uncontroversial.

"The technology challenges of producing genetically engineered animals are gone," said Charles Long, a biologist at Texas A&M University who

says he works in pretty much any livestock animal except chickens. “What we have to do is really start producing the animals that have these traits.”

Gene-edited plants will soon be in the grocery store, but similar tinkering with the DNA of animals faces a far more uncertain future. The regulatory process for getting animals approved is more complex and treats the edited DNA as a veterinary drug - a difference that animal scientists argue will effectively kill their field by preventing innovations that could make raising livestock more sustainable, more efficient or more humane. Many advocates and ethicists agree that the current oversight system is a poor fit but think that scientists and industry underestimate potential safety concerns.

“I don’t want speed limits, either, but they have a role,” said Jaydee Hanson, senior policy analyst at the Center for Food Safety.

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