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## Genetically engineered hornless cattle: flaws in the genome overlooked

New techniques for genetic engineering not as precise as claimed

6 August 2019 / According to research undertaken by experts at the US Food and Drug Administration (FDA), gene-editing errors in the genome of the animals are, in many cases, often being overlooked. This was the finding from the FDA genome analyses of cattle genetically engineered not to grow horns. The animals were genetically engineered by Recombinetics; the company also filed a patent on the genetically engineered cattle. The cattle have for some years been held up and presented as a positive example for the application of new genetic engineering techniques. However, it appears to have so far gone unnoticed that the gene-editing has resulted in major unintended effects.

The gene scissors (nucleases) used in this case are known as TALENs; a method frequently described as highly precise. However, as the FDA research shows, apart from the desired gene sequences being inserted into the genome, DNA originating from genetically engineered bacteria used in the process was also inserted. The researchers found, amongst others, complete DNA sequences that confer antibiotic resistance in the genome of the cattle. No research has been carried out on the possible consequences for animal health, or whether these additional genes are biologically active.

As the experts from the FDA point out, the errors caused by the genetic engineering technique are unlikely to be individual cases. So far, the methods used to search for unintended effects in GE animals are frequently inadequate, and are used even though much better technologies are available.

Recombinetics has already applied for more than a dozen patents on genetically engineered animals. The large breeding corporates, Genus and Hendrix Genetics, might be amongst those profiting from the introduction of these animals on the market. Both companies have contracted and funded the work of Recombinetics and its affiliate Acceligen. In addition to polled cattle, Recombinetics is moving to develop a precision gene-editing breeding method to eliminate the need to castrate pigs. Alongside questions about safety and ethics, there are urgent questions that need to be answered regarding the application of gene-editing techniques, which in general lead to massive problems in animal welfare.

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**Further information:** [The research on gene analysis](#) [2]

[Cooperation between Recombinetics and Genus](#) [3]

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