EUROGROUP FOR ANIMALS

# Why new genomic techniques will not solve the problems linked to intensive animal agriculture

Position Paper

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## Background

Over the course of history, mankind managed to alter animals' traits such as size, colour, body shape, docility as well as their productivity through selective breeding. In 1973 the pursuit of scientific endeavours led Herbert Boyer and Stanley Cohen to successfully genetically engineer a living organism by transferring a gene from one bacteria strain to another.[1]

In the half century since then, technological advancements in the field of biotechnology have allowed scientists to directly modify the DNA of animals in such a way that it caught the attention of the scientific community, governments, media and civil society. The first generation of genetic engineering inserts genes at a random location into an organism's own DNA. The inserted genes generally confer a trait, modifying the genetic material of the animal. However, this method does not always deliver the desired outcomes,[2] and organism's genome often results in unpredictable effects.[3] Thus, the biotech industry has developed a second generation of genetic engineering techniques - New Genomic Techniques (NGTs). Genome editing is a part of the second generation of genetic engineering which makes it possible to introduce small or large changes into the genetic material (DNA) of every type of cell in any organism (microorganisms, plants, animals and humans). This involves either the introduction of 'new' genes (insertions) or making small changes (mutations or deletions) in the DNA of an organism.[4]

Currently, no genetically modified animals or derived products are on the EU market, nor have any applications for GM animals been received in the EU.[5] As for the rest of the world, the only genetically engineered animal approved for human consumption is a genetically engineered salmon, called the AquAdvantage salmon, approved only in the U.S. and Canada.

[1] Cohen S., Chang C.Y.A., Boyer W.H., Helling B.R. (1973). Construction of Biologically Functional Bacterial Plasmids In Vitro. Proc Natl Acad Sci USA. 3240–3244. November 7, 1973. Doi: 10.1073/pnas.70.11.32400(11).

[2] Cotter J., Perls D., M.C.P. (2019). Genetically Engineered Animals: From Lab to Factory Farm. Friends of the Earth U.S. September 2019.

[3] Tan W., Proudfoot C., Lillico S.G., Whitelaw C.B. (2016). Gene targeting, genome editing: from Dolly to editors. Transgenic Res. 273-87. Doi: 10.1007/s11248-016-9932-x.

[4] Cogem. (2018). CRISPR & Animals Implications of Genome Editing for Policy and Society. commissie genetische modificatie Cogem. May 1, 2018.

[5] European Food Safety Authority. Genetically modified animals. Accessed: 14th December, 2021. https://www.efsa.europa.eu/en/topics/topic/genetically-modified-animals

## Eurogroup for Animals' position

The NGTs come at the moment in which the international community attempts for a transition towards a more plant-based diet, and consumer demand for higher animal welfare standards is at an all-time high. While the promises of increased animal welfare (e.g. by creating hornless cattle), improved productivity (e.g. by creating faster-growing double-muscled cows) and decreased environmental pressure (e.g. by creating disease resistant pigs) are thought-provoking, there are concerns about the use of NGTs as they will not bring about any change to methods of production in general. Genome editing will most likely only exacerbate already poor handling practices and housing conditions. Instead of improving the current environment, genome editing could result in disease resilient pigs raised in unacceptable conditions, or double-muscled cattle raised without proper ventilation and space. Additionally, the application of NGTs on live animals raises significant concerns that it will increase the risk of:

- Interfering with animal naturalness as the genomas would be changed in a way and with a speed that cannot occur in nature;
- Negatively impacting animal health and welfare by, for instance, changing the body and the behavioural pattern of animal species (e.g. changes in the body morphologies can impair certain abilities, thus interfering with natural behaviour);
- Threatening public health by creating, through unintended changes to the genome, organisms that are resistant to certain antibiotics;
- Promoting the patronage model of the human/animal relationship with the former increasingly seeing itself as 'creator', 'designer' or 'patron'; and
- Harming the environment for instance by supporting further intensification of animal agriculture, increasing the demand for feed, and producing waste that contains novel gene products and can have a negative impact on microbial and insect ecologies.

## Conclusion

NGTs will most likely not solve the most disruptive problems associated with current animal farming. The high-intensity methods of animal farming create and further perpetuate problems that go well beyond the technical possibilities of NGTs. For this and other reasons, **Eurogroup for Animals strongly opposes the application of the NGTs on farm animals**. Even if a cost-benefits analysis would show the desirability of NGTs, Eurogroup for Animals would consider it to be unacceptable from an ethical perspective, as these technologies consider animals as results of a techne,[6] rather than creatures that are the owners of their own feelings, bodies and behaviours.

**In order to overcome the problems stemming from industrial animal farming, the EU must transition our means of production to truly sustainable agroecological solutions including integrated crop-livestock systems that have animal welfare at their core**.[7] Such systems have the potential to improve the health and welfare of the animals, increase productivity and soil fertility, reduce risk of antibiotic-resistant bacteria and pesticides, and save water. In other words, the key to a successful transition to a better functioning system of animal agriculture is the adoption of alternative animal husbandry practices.[8]

[6] For Aristotle *Techne* is the rational method involved in producing an object or accomplishing a goal or objective.

[7] Steven, P. (2019). What kinds of agriculture will help us reach the sustainable development goals? UN Environment issue No. 35. May 2nd, 2019.

[8] European Union (2021). Ethics of Genome Editing. European Group on Ethics in Science and New Technologies (EGE). European Union Publication Office. March 19th, 2021. doi:10.2777/659034.

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