

# Stakeholder questionnaire on new genomic techniques to contribute to a Commission study requested by the Council

Fields marked with \* are mandatory.

## Questionnaire on new genomic techniques to contribute to the study requested by the Council

Discussed and finalised in the Ad-hoc Stakeholder meeting on 10 February 2020

### Background

The Council has requested [1] the Commission to submit, by 30 April 2021, “a study in light of the Court of Justice’s judgment in Case C-528/16 regarding the status of novel genomic techniques under Union law” (*i. e.* Directive 2001/18/EC, Regulation (EC) 1829/2003, Regulation (EC) 1830/2003 and Directive 2009/41 / E C ) .

To respond to this Council’s request, the Commission is collecting contributions from the stakeholders through the questionnaire below. The study covers all new genomic techniques that have been developed a f t e r 2 0 0 1 .

### Instructions

For the purpose of the study, the following definition for new genomic techniques (NGTs) is used: techniques that are capable of altering the genetic material of an organism and which have emerged or have been developed since 2001 [2].

Unless specified otherwise, the term “NGT-products” used in the questionnaire covers plants, animals, micro-organisms and derived food and feed products obtained by NGTs for agri-food, medicinal and industrial applications and for research.

Please substantiate your replies with explanations, data and source of information as well as with practical examples, whenever possible. If a reply to a specific question only applies to specific NGTs/organisms, please indicate this in the reply.

Please indicate which information should be treated as confidential in order to protect the commercial

[1] Council Decision (EU) 2019/1904, OJ L 293 14.11.2019, p. 103-104, <https://eur-lex.europa.eu/eli/dec/2019/1904/oj>

[2] Examples of techniques include: 1) Genome editing techniques such as CRISPR, TALEN, Zinc-finger nucleases, mega nucleases techniques, prime editing etc. These techniques can lead to mutagenesis and some of them also to cisgenesis, intragenesis or transgenesis. 2) Mutagenesis techniques such as oligonucleotide directed mutagenesis (ODM). 3) Epigenetic techniques such as RdDM. Conversely, techniques already in use prior to 2001, such as Agrobacterium mediated techniques or gene gun, are not considered NGTs.

[3] Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC, OJ L 295, 21.11.2018, p. 39–98

### **Guidelines**

*Please note that the survey accepts a maximum of 5000 characters (with spaces) per reply field. You might be able to type more than 5000 characters, but then the text will not be accepted when you submit the questionnaire. You will also receive a warning message in red colour below the affected field.*

*You have the option to upload supporting documentation in the end of each section. You can upload multiple files, up to the size of 1 MB. However, note that any uploaded document cannot substitute your replies, which must still be given in a complete manner within the reply fields allocated for each question.*

*You can share the link from the invitation email with another colleague if you want to split the filling-out process or contribute from different locations; however, remember that all contributions feed into the same single questionnaire.*

*You can save the draft questionnaire and edit it before the final submission.*

*You can find additional information and help here: <https://ec.europa.eu/eusurvey/home/helpparticipants>*

***Participants have until 15 May 2020 (close of business) to submit the questionnaire via EUsurvey.***

## **QUESTIONNAIRE**

Please provide the full name and acronym of the EU-level association that you are representing, as well as your Transparency Registry number (if you are registered)

If the name of the association is not in English, please provide an English translation in a parenthesis

Compassion in World Farming (CIWF)

Please mention the sectors of activity/fields of interest of your association

farmed animals and their welfare

If applicable, please indicate which member associations (national or EU-level), or individual companies /other entities have contributed to this questionnaire

If applicable, indicate if all the replies refer to a specific technique or a specific organism

## A - Implementation and enforcement of the GMO legislation with regard to new genomic techniques (NGTs)

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\* 1. Are your members developing, using, or planning to use NGTs/NGT-products?

- Yes  
 No  
 Not applicable

\* Please explain why not

CIWF is non-profit organisation, part of the civil society. We do not engage in any economic activity involving NGTs or older genetic engineering techniques. We do not have members but a broad range of supporters, reaching over one million citizens. New genetic techniques involve gene editing which in the case of animals involves procedures that cause pain and suffering. Many animals can be used to produce a single individual with the desired effect. The sustainability of NGTs has not been yet assessed, thus we do not support using products or organisms that haven't been assessed in regards to environmental, economic, social and other impacts.

\* 2. Have your members taken or planned to take measures to protect themselves from unintentional use of NGT-products?

- Yes  
 No  
 Not applicable

\* 3. Are you aware of initiatives in your sector to develop, use, or of plans to use NGTs/NGT-products?

- Yes  
 No  
 Not applicable

\* Please provide details

Most initiatives to develop animals using genetic engineering serve to prop up intensive animal farming systems and serve the needs of the sector and its potential for profit making, with compromising results to the animals' welfare. The ruling of the European Court of Justice defines NGT as GMOs. We do not support the genetic editing of animals under most circumstances. If there would be an exceptional case that could be considered, then animal welfare would need to be seriously assessed among any other risk factors, as well as an examination of alternative methods.

**\* 4. Do you know of any initiatives in your sector to guard against unintentional use of NGT-products?**

- Yes
- No
- Not applicable

**\* 5. Are your members taking specific measures to comply with the GMO legislation as regards organisms obtained by NGTs?**

Please also see question 8 specifically on labelling

- Yes
- No
- Not applicable

**\* 6. Has your organisation/your members been adequately supported by national and European authorities to conform to the legislation?**

- Yes
- No
- Not applicable

**\* 7. Does your sector have experience or knowledge on traceability strategies, which could be used for tracing NGT-products?**

- Yes
- No
- Not applicable

**\* 8. Are your members taking specific measures for NGT-products to ensure the compliance with the labelling requirements of the GMO legislation?**

- Yes
- No
- Not applicable

**\* 9. Do you have other experience or knowledge that you can share on the application of the GMO legislation, including experimental releases (such as field trials or clinical trials), concerning NGTs/NGT-products ?**

- Yes
- No
- Not applicable

Please upload any supporting documentation for this section here. For each document, please indicate which question it is complementing

The maximum file size is 1 MB

## B - Information on research on NGTs/NGT-products

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\* 10. Are your members carrying out NGT-related research in your sector?

- Yes
- No
- Not applicable

\* 11. Are you aware of other NGT-related research in your sector?

- Yes
- No
- Not applicable

\* 12. Has there been any immediate impact on NGT-related research in your sector following the Court of Justice of the EU ruling on mutagenesis?

Court of Justice ruling: Case C-528/16 <http://curia.europa.eu/juris/documents.jsf?num=C-528/16>

- Yes
- No
- Not applicable

\* Please explain why not

Compassion in World Farming is very concerned about the detrimental impacts on animal welfare of the application of NGTs, given that increasing evidence is pointing to unintended consequences which have not been fully disclosed or examined.

\* 13. Could NGT-related research bring benefits/opportunities to your sector/field of interest?

- Yes
- No
- Not applicable

\* Please explain why not

Compassion in World Farming supports the position that the added value of using NGTs in the food and farming sector cannot be demonstrated, as there is no available evidence of positive effects in terms of environmental, economic and social impacts, and of course animal welfare.

The industry may exploit new technologies to boost the already excessive production yields of animals, which leads to further intensification of farming. We are against such a scenario given the immense negative impacts on the environment, animal welfare, human health and our limited planetary resources.

\* 14. Is NGT-related research facing challenges in your sector/field of interest?

- Yes
- No
- Not applicable

\* Please provide concrete examples/data

We believe that the focus of the research is on developing and applying new technology while the focus should be on protecting human and animal health from NGT-related risks, as well as examining possible negative environmental impacts.

\* **15. Have you identified any NGT-related research needs/gaps?**

- Yes
- No
- Not applicable

\* Please specify which needs/gaps, explain the reasoning and how these needs/gaps could be addressed

We need research on detection methods in order to safeguard human health, animal health and welfare, environmental effects and provide information to consumers.

There also can be complex interactions with other organisms which we are not aware of, an area of particular importance which calls for more research. There are serious questions around the fact that NGTs may produce 'unexpected' results as in the recent case with gene edited cattle to produce hornless animals and unexpected results regarding the development of an antibiotic resistant gene, a process which was unnecessary in the first place because polled cattle (hornless) can be produced by selecting breeding.

Developments and applications of GE in animals for human consumption and for research purposes:

- involve procedures that may cause animals pain, suffering or distress;
- use very large numbers of animals;
- enable a greater number of species to be manipulated;
- encourage a wider variety of applications, leading to increased animal use and suffering;
- increase the perception of animals as 'commodities' for human benefit, e.g. as research tools or units of production;
- are progressing at a rate that is outstripping ethical debate and public understanding.

Research funding would be far better invested in driving:

- a radical and rapid shift away from industrial animal agriculture;
- non-animal research models.

*Please upload any supporting documentation for this section here. For each document, please indicate which question it is complementing*

The maximum file size is 1 MB

## **C - Information on potential opportunities and benefits of NGTs/NGT-products**

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\* **16. Could NGTs/NGT-products bring benefits/opportunities to your sector/field of interest?**

- Yes
- No

\* Please explain why not

We don't believe there's added value to the food and farming sector since there is no overall assessment of NGTs as to any health, welfare, environmental, economic and social impacts. Long-term impact assessments would be needed on all of the above areas.

**\* 17. Could NGTs/NGT-products bring benefits/opportunities to society in general such as for the environment, human, animal and plant health, consumers, animal welfare, as well as social and economic benefits?**

- Yes  
 No

\* Please explain why not

Medical research could be one area to benefit.  
Potential benefits/opportunities in other fields are quite hypothetical for the time being. These claims have to be carefully assessed.  
In regards to the farming and food sector, NGTs may create more food insecurity contrary to claims for the opposite. Extreme caution is called for; we need to challenge claims for benefits until that time when there will be systematic and long term assessments in regards to the environment, human, animal and plant health, animal welfare, as well as to our society and economies.  
In terms of animal welfare, we believe that these techniques involve procedures that cause suffering and waste animals' lives. In addition, the impact of each genetic change on the animal's wellbeing is often not known before the edit is made, and effects can also be unpredictable.

**\* 18. Do you see particular opportunities for SMEs/small scale operators to access markets with their NGTs/NGT-products?**

- Yes  
 No

\* Please explain why not

NGTs will probably lead to an acceleration of the concentration of the industry. Small and medium size companies will not be in a position to compete with large companies and institutes.  
In addition, since this research involves patents and licenses which are quite costly, SMEs are presented with another obstacle that won't be easy to overcome.

**\* 19. Do you see benefits/opportunities from patenting or accessing patented NGTs/NGT-products?**

- Yes  
 No

\* Please explain why not

Patents present a threat to food security, make people dependent on this technology, do imply added costs, and in the case of the farming sector, they decrease biodiversity which can be catastrophic in the long run.

*Please upload any supporting documentation for this section here. For each document, please indicate which question it is complementing*

## D - Information on potential challenges and concerns on NGTs/NGT-products

\* 20. Could NGTs/NGT-products raise challenges/concerns for your sector/field of interest?

- Yes  
 No

\* Please describe and provide concrete examples/data

In regards to genetic engineering used in farmed animals:

[http://www.nytimes.com/2015/11/27/us/2015-11-27-us-animal-gene-editing.html?hp&action=click&pgtype=Homepage&clickSource=story-heading&module=photo-spot-region&region=topnews&WT.nav=top-news&\\_r=0](http://www.nytimes.com/2015/11/27/us/2015-11-27-us-animal-gene-editing.html?hp&action=click&pgtype=Homepage&clickSource=story-heading&module=photo-spot-region&region=topnews&WT.nav=top-news&_r=0)

This article refers to GE work in farm animals to produce:

- Hornless dairy cattle
- Animals that are resistant to certain diseases
- Pigs that can be fattened with less food
- Brazilian beef cattle that grow large muscles, yielding more meat
- Chickens that produce only females for egg-laying
- Cattle that produce only males, since females are less efficient at converting feed to muscle
- Meatier cashmere goats that also grow longer hair for soft sweaters
- Miniature pigs lacking a growth gene to be sold as novelty pets
- Animals with genetic resistance to a variety of diseases in livestock; this could theoretically reduce the overuse of antibiotics in farming.

The development of NGTs/NGT-products raises enormous concerns for animal welfare, ethical uses of animals and for those concerned with these important issues.

Developments and applications of GE in animals for human consumption:

- involve procedures that may cause animals pain, suffering or distress;
- use very large numbers of animals;
- enable a greater number of species to be manipulated;
- encourage a wider variety of applications, leading to increased animal use and suffering;
- increase the perception of animals as 'commodities' for human benefit, e.g. as research tools or units of production;
- are progressing at a rate that is outstripping ethical debate and public understanding.

We are concerned that genetic engineering techniques purport to offer solutions to problems that can be dealt with simpler, less high-tech ways. NGT solutions may even exacerbate the problem. For example, there's the suggestion that gene editing can be used to provide disease resistance and reduce antibiotic use in farming. However, this problem is much better addressed by moving away from intensive farming as this will result in healthier animals with strengthened immune systems making them less vulnerable to disease.

Also, the suggestion that NGTs can contribute to feeding the growing world population does not seem to be valid because in the case of gene edited animals, they are likely to be primarily used in industrial systems which will actually undermine food security and lead to environmental degradation.

New genome techniques, such as genome editing using mechanisms such as CRISPR-Cas, make changes within the DNA of organisms with relative ease and efficiency in comparison to previous genetic modification



technology. These GE techniques remove a number of technical barriers to modifying the genetic makeup of plants, animals and humans. This has created a new momentum in animal biotechnology which is generating a broad range of potential applications not just in farmed animals, but also in companion animals, laboratory animals as well as in human medicine (such as somatic cell editing), and also the control of 'undesirable' animal populations in the wild.

The techniques are 'inefficient' and require procedures that cause suffering and waste animals' lives. The impact of each genetic change on the animal's wellbeing is often not known before the edit is made, and effects can also be unpredictable.

These concerns, and the ethical issues emanating from them apply not only to farmed animals, but also to other animals, such as those used in research and testing, in the creation of 'pets', sports animals and 'living art', in the 'de-extinction' of extinct or endangered animals, and in the population control of 'undesirable' species.

\* Are these challenges/concerns specific to NGTs/NGT-products?

- Yes  
 No

\* Please explain

The animal breeding industry wants to employ new technologies and sees potential in the new GE techniques. However, compared with previous technology, genome editing raises additional societal concerns because:

- it can be more difficult to predict the nature and/or level of harms, new phenotypes with multiple mutations can be created, either through 'multiplexing' the desired changes and/or introducing unintended changes elsewhere in the genome;
  - if manipulation via genome editing attempts to recreate a trait that naturally occurs in other populations, it will leave no trace that the new variant was artificially 'created'. This creates serious concerns around traceability, product labelling and consumer choice
  - convergence of gene drive with gene editing means whole populations may be altered in a few generations
  - these techniques may be applied to a much wider range of species than previous genetic modification methods, and live, edited animals are generated more rapidly;
  - the accessibility of these new tools enable use of 'Biohacking' 1 & DIY kits in garage 'labs';
  - many people hold beliefs that make them especially concerned about the application of genome editing
- There are also legitimate and fundamental public concerns about interfering with animals' integrity, and the application of new techniques simply because they are available, without proper consensus as to whether it is 'right' to manipulate animals in this way or whether people would find the subsequent uses of these animals acceptable. These concerns need to be addressed.

\* **21. Could NGTs/NGT-products raise challenges/concerns for society in general such as for the environment, human, animal and plant health, consumers, animal welfare, as well as social and economic challenges?**

- Yes  
 No

\* Please describe and provide concrete examples/data

We fear that NGTs will be used to further intensify the Western world's already very intensive animal farming sector. NGTs may be used to increasing growth rates (in meat chickens, pigs and certain farmed fish

species) or yield (in dairy cows and egg laying hens.) or litter size (in pigs). In each case, this has had highly detrimental impacts on animal health and welfare.

The European Food Safety Authority (EFSA), which is responsible for reviewing the literature on animal welfare in the EU, has concluded that “long term genetic selection for high milk yield is the major factor causing poor welfare, in particular health problems, in dairy cows”, and “the genetic component underlying milk yield has also been found to be positively correlated with the incidence of lameness, mastitis, reproductive disorders and metabolic disorders”.

Scientific Opinion of the Panel on Animal Health and Welfare on a request from European Commission on welfare of dairy cows. The EFSA Journal (2009) 1143, 1-38

EFSA has also concluded that genetic selection of pigs for rapid growth has led to leg disorders and cardiovascular malfunction. A large-scale UK study into leg disorders in broilers found that 27.6% of the chickens had gait scores of 3 or more, i.e. lameness that is likely to be painful. The study concluded that “the primary risk factors associated with impaired locomotion and poor leg health are those specifically associated with rate of growth”. The high productivity of the modern laying hen causes osteoporosis and so creates a substantial risk of fractures both during the laying period and at depopulation at the end of lay. Scientific Opinion of the Panel on Animal Health and Welfare on a request from the Commission on Animal health and welfare in fattening pigs in relation to housing and husbandry. The EFSA Journal (2007) 564, 1-14 Knowles, T. G., Kestin, S. C., Haslam, S. M., Brown, S. N., Green, L. E., Butterworth, A., Pope, S. J., Pfeiffer, D. and Nicol, C. J., 2008. Leg disorders in broiler chickens: prevalence, risk factors and prevention. Plos one 3 (2): e1545. doi: 10.1371/journal.pone.0001545.

Laywell: Welfare implications of changes in production systems for laying hens: Deliverable 7.1

The breeding of sows for large litters results in high levels of mortality due to low birth weights; these are also associated with a variety of negative long-term effects on piglets, such as increased reactivity to stress, throughout the pig’s lifetime. Large litters can result in intense teat competition which can be painful for the sow and lead to some piglets failing to gain adequate access to milk.

The Ethical and Welfare Implications of Large Litter Size in the Domestic Pig: Challenges and Solutions, 2011. The Danish Centre for Bioethics and Risk Assessment and The Scottish Agricultural College

NGTs have the potential to exacerbate the adverse impact of genetic selection on the health and welfare of farm animals.

We are also concerned that NGTs will be used to address diseases inherent in industrial animal farming. FAO stresses that industrial animal farming plays an important part in the emergence and spread of diseases. Also the European Medicines Agency has said that in production systems with a high density of animals, the development and spread of infectious diseases is favoured.

\* Under which conditions do you consider this would be the case?

NGTs may involve the death of some animals. One leading researcher has stressed that “The generation and use of transgenic animals are not neutral as they imply the sacrifice and in some cases the suffering of animals”.

Many GM embryos do not survive, and of those that do survive only a small proportion (between 1% and 30%) carry the intended genetic modification. Current GM techniques are relatively inefficient, with many surplus animals being exposed to harmful procedures – undermining efforts to minimise animal use. It would be helpful to establish whether similar problems arise in gene editing.

Ormandy E. H., Dale J., Griffin G. 2011. Genetic engineering of animals: Ethical issues, including welfare concerns. The Canadian Veterinary Journal, May, 52(5): 544-550. www.ncbi.nlm.nih.gov/pmc/articles/PMC3078015/)

\* Are these challenges/concerns specific to NGTs/products obtained by NGTs?

- Yes  
 No

\* Please explain

NGTs are not necessary to help feed the world's growing population because they have a big toll on the environment and animal welfare and will be used to further industrialise agriculture. Industrial animal production is profoundly inefficient because of its dependence on feeding grain – much of which could be used for direct human consumption – to animals who convert it very inefficiently into meat and milk. The FAO warns that further use of cereals as animal feed could threaten food security by reducing the grain available for human consumption. Trying to increase production by further intensification of animal production – achieved in part by NGTs – would be environmentally damaging.

\* **22. Do you see particular challenges for SMEs/small scale operators to access markets with their NGTs /NGT-products?**

- Yes  
 No

\* Please explain and provide concrete examples and data

In general, SMEs have limited access to technology, and the patenting and licencing would be difficult in their case.  
The consolidation of the industry works against SMEs. Most patents are controlled by few large corporations.

\* **23. Do you see challenges/concerns from patenting or accessing patented NGTs/NGT-products?**

- Yes  
 No

\* Please describe and provide concrete examples/data

Patenting will accelerate industry consolidation and will reduce diversity while at the same time it may failed to deliver on promised results, including increased yields.

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## E - Safety of NGTs/NGT-products

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\* **24. What is your view on the safety of NGTs/NGT-products? Please substantiate your reply**

We believe the precautionary principle should be applied.

**\* 25. Do you have specific safety considerations on NGTs/NGT-products?**

- Yes  
 No

\* Please explain

This response focuses on the safety of the organism being edited. We are extremely concerned about adverse outcomes due to the consequences of the desired edit (intended effects) and unintended changes that may arise. Adverse outcomes can also be engendered by alterations elsewhere in the genome. The use of this technology will serve to support industrial animal agriculture which has detrimental consequences on the welfare of animals, and on the environment, human health and people's livelihoods. Claims that the newer gene editing techniques are much more precise, and have few (if any) unintended effects cannot be substantiated. Off-target and unintended alterations seem to be under-reported, as indicated earlier in the questionnaire. The GE 'polled' calves were revealed to carry multiple antibiotic resistance genes despite the researchers originally reporting no unexpected alterations. Even more concerning is the presence of 'stray DNA' within edited genomes as in the case of goat and bovine DNA reported in edited mouse genomes. This demonstrates that GE is a potential mechanism for horizontal gene transfer of pathogens, including, but not limited to viruses. The mechanisms that repair double-stranded breaks in DNA from GE can also result in increased risk of cancer, and there are increasing reports of widespread deletions and rearrangements.

*Please upload any supporting documentation for this section here. For each document, please indicate which question it is complementing*

The maximum file size is 1 MB

## **F - Ethical aspects of NGTs/NGT-products**

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**\* 26. What is your view on ethical aspects related to NGTs/NGT-products? Please substantiate your reply**

Selective breeding has been used to change animal characteristics, behavior and productivity. More recently, drugs and hormones have been used. All these raise animal welfare and ethical issues. However, gene editing enables rapid, instant, substantial and multiple changes to the genome, in a wider variety of species, thereby removing a number of technical barriers to modifying genomes. This raises significant animal welfare and ethical concerns.

**\* 27. Do you have specific ethical considerations on NGTs/NGT-products?**

- Yes  
 No

\* Please explain

New genetic techniques are currently dominated by gene editing using molecular tools such as CRISPRCas. 'Editing' an animal's genome involves procedures that cause pain, suffering, distress and lasting harm.

It is an inefficient process, using large numbers of animals to produce a single individual with the desired edit. Despite claims that these newer GE techniques are much more precise than previous methods, they still cause unpredictable and unintended changes to the genome, which are only just starting to be reported.

Gene editing (GE) has been positioned as a viable tool to address challenges such as increasing human demands for: animal protein, meats of specific qualities and animals resistant or resilient to infectious disease. It has also been suggested to help respond to animal welfare concerns and to global heating (e.g. by creating 'hornless cattle' and heat tolerant animals). However, there are alternative approaches to addressing all of these challenges, including improving animal husbandry and reducing consumption of animal products in favour of plant-based foods.

Across the EU there is currently no market for products made from genetically modified animals, but regardless of the lack of public acceptance, GE has been used in recent years to generate hundreds of edited pigs, cattle, sheep and goats. These will potentially be used to create genetic lines with disease resistance and resilience traits, or enhanced productivity. If the majority of people are not willing to accept GE animal products, then there is still no market for them, and research efforts - and animal lives - are wasted. This raises the question of why research into generating GE animals is being funded by the taxpayer, and how the public might feel about being unwittingly complicit in this research.

Editing the genomes of animals is regulated by legislation controlling animal research and testing such as the EU Directive 2010/63, and legislation controlling GMOs such as Genetically Modified Organisms (Contained Use) Regulations 2014. Gene editing is subject to strict rules on authorisation, release, use in feed and food and labelling. These rules were set up to ensure a high level of protection of human life and health, animal health and welfare, environment and consumer interests in relation to genetically modified food and feed, whilst ensuring a high level of protection of animal health and welfare. We believe that products of new genetic modification techniques should remain strictly regulated as GMOs.

*Please upload any supporting documentation for this section here*

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## G - Consumers' right for information/freedom of choice

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### \* 28. What is your view on the labelling of NGT-products? Please substantiate your reply

There are several important issues relating to consumer choice. It is worth restating that the public generally does not accept genetically modified animals in food. However, with regulations being inconsistent across international borders and the technical difficulties in distinguishing between naturally occurring and 'engineered' mutations, there is a risk that GE food products will find their way onto supermarket shelves here. Recent consultations show that the public was "not convinced of the need" to use GE to develop faster growing animals for human consumption and that gene editing farm animals to increase efficiency /profitability was seen as less acceptable use of the technology. There are legitimate public concerns around animal integrity and 'naturalness', but the use of GE is escalating without public consensus on whether it is right to manipulate animal genomes in this way, and for what purposes. It is imperative to ensure public trust and enable informed purchasing choices in any GE application in farmed animals. Any future developments must be transparent, accessible to, and acceptable to the public, with clear product labelling that does not use misleading euphemisms such as 'precision breeding' or 'smart breeding'.

*Please upload any supporting documentation for this section here. For each document, please indicate which question it is complementing*

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## H - Final question

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**\* 29. Do you have other comments you would like to make?**

- Yes  
 No

Please provide your comments here

Gene editing of farm animals should not be permitted.

In case of exceptional circumstances, a thorough impact assessment needs to show that:

- There will be no detrimental impact on animal health and welfare
- No less intrusive method of achieving the desired objective is available
- The desired objective does not entail facilitating the use of industrial animal farming systems as these have a wide range of inherent disadvantages for animal health and welfare.

In addition, any risks, harms, ethical issues and alternative approaches need to be carefully considered.

*Please upload any supporting documentation for this section here. For each document, please indicate which question it is complementing*

The maximum file size is 1 MB

## Contact

SANTE-NGT-STUDY@ec.europa.eu