Annex 2C

English translation of the information material shared in the focus group discussions with farmers.

Article title: Is gene editing natural and does it matter? A qualitative analysis of citizen-consumers' and farmers' views on the use of new genomic techniques in plants

Journal: Agriculture and Human Values

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New methods

- New genome techniques have developed especially rapidly in the last decade. New genomic technologies (e.g. gene editing) are based on different methods compared to older ones.

- A central difference according to experts is precision. New methods can be used to define the type of change very accurately. Old methods are more described by randomness: the actual type of change induced is more difficult to define accurately with these methods.

- Compared to tradititional breeding methods, a central difference is speed.

- Both old (randomizing), and new (precision) methods can be used to create mutagenesis, i.e. mutations the plant's genome, or used for gene transfers. Genes can be transferred either within a species (cisgenesis) or across species (transgenesis).

- Mutation of genes and gene transfers within species can also occur naturally or by the utilisation of traditional breeding methods. Cross-species gene transfers cannot happen in nature or with traditional breeding methods.

Random mutagenesis is at the moment outside the gene technology legislation, i.e. it's use is freely allowed. Other methods are under the same legislation, which means any organisms produced are GMOs under current legislation.

	Mutagenesis, i.e. artificial creation of mutations	Within-species gene transfer (Cisgenesis)	Across-species gene transfer (Transgenesis)
Random methods Older gene technologies create mutations or transfer genes to random places in the genome.	Radiation (UV or radioactive) or chemicals Currently the only method accepted in the EU	Random gene transfer using Agrobacterium or gene gun	Random gene transfer using Agrobacterium or gene gun
Precision methods i.e. new genomic techniques create mutations or transfer genes very accurately to a specific place in the genome. Gene editing comprises of a number of new SDN technologies that allow modifying genes using nuclease enzymes.	SDN-type 1 and 2 techniques modify the DNA with precision. Cannot be discerned from naturally born mutations. E.g. CRISPR-Cas9	Transfer of an entire gene, cannot be discerned from ordinary cross-breeding. SDN3-technology.	A transfer of a gene or DNA to a target from another species. This would not happen in nature. SDN3-technology.

Proposal to amend the regulation

- Currently only the random mutagenesis does not belong under the EU GMO-legislation. IT is free to use.
- The new proposal would be less stringent for plants produced with gene technologies that could develop also naturally or using traditional breeding methods. Plants produced using these methods would go through a *verification procedure*. If they would pass the procedure and fill its criteria, they would be treated as ”ordinary” plants. This would mean no requirements on risk assessement or labelling.
- In practice, these methods mean targeted mutagenesis and within species gene transfers (cisgenesis).
- In practice, the regulation would govern end-products (e.g. pest-resilient potato), not the methods themselves.
- All methods used for across species gene transfers, would be still treated as belonging to the old GMO legislation. This refers to both old and new methods.
- Any gene-modified plants produced with old or new methods would not be allowed in organic production.

Examples

- Wheat – disease resistance, drought resilience, nutritional values, better yield
- Rice – e.g. pest and disease resistance
- Tomato – disease resistance, taste, cargo and storage endurance
- Potato – disease resistance