European Commission

Explanatory Note on

New techniques in Agricultural Biotechnology

People have always selected plants and animals for improvement.

Breeding, however done, modifies the DNA of plants and animals for:

- **Resistance**
- **Vigour and yield**
- **Better nutrition**

Different groups hold strong views on **new breeding techniques**, e.g. gene editing CRISPR-Cas9

These relate to **risks**, **benefits** and **ethics**

Overview of **new** and **existing breeding techniques**

	Conventional breeding	Established genetic modification	New breeding techniques
	breeding and selection over generations expose DNA to chemicals or radiation	insert desired genes from an external source	In gene editing, targeted modification of genes
	if beneficial, **random mutations** are **selected**	**genes** are **altered** and **transferred**	**genes** are **altered** in a **specific** and **precise** way
precision desired location in the DNA	very low	low	very high
speed to obtain the final product	slow	fast	very fast
unintended effects	many	some	rare

Considerations

In all techniques:

Safety assessments should target the **final product** and the **application**, rather than the technique itself

Analysis should focus on each particular technique due to the **high variability** in their molecular mechanisms

In new breeding techniques:

Some DNA changes are difficult to detect and distinguish from spontaneous mutations

Impact

This explanatory note informs public and stakeholder debate.

Together with a statement of the regulatory status of gene edited products (November 2018), the Advisors recommended a revision of the genetically modified organisms directive to better reflect up to date scientific evidence.

This is a summary of an explanatory note by the **Group of Chief Scientific Advisors,** an Independent expert group providing high-quality and timely scientific advice to the European Commission, to inform European Union policies and legislation, and informed by SAPEA.

Read the full report here.

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