‘New genetic engineering’ techniques associated with numerous risks

New scientific paper demonstrates the need for process oriented risk assessment
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A new scientific paper published in the Environmental Sciences Europe journal gives an overview of the risks associated with genome editing procedures (new genetic engineering) for plants and animals. The risks are not only restricted to a wide range of unintended effects that can be triggered by the process of genome editing. There are also risks associated with the intended biological characteristics generated through genome editing.

Genome editing techniques, in particular those using the CRISPR/Cas 'gene scissors', increase the possibilities and speed with which the genomes of plants and animals can be altered. It does not matter whether additional genes are introduced into the genome or not. Small genetic modifications are often performed in combination and can cause significant changes in metabolic pathways and plant composition. The study concludes that the novel, intended properties must be thoroughly tested, even if no additional genes are inserted.

Furthermore, the study provides a systematic overview of unintended effects that are specific to the use of genome editing. Errors triggered by the process are found 'off-target' at sites in the genome other than the target site, and also in the region of the target site, ‘on target’. These effects include, for example, the misreading of DNA which can lead to changes in protein composition, unintended insertion of DNA sequences, deletions and rearrangements of DNA. Again, all these genetic errors can arise whether or not genes are inserted.

The new study found that genome-editing of plants frequently makes use of older genetic engineering techniques, and argues that any genetic errors resulting from the application of these older techniques also need be taken into account. The background: in order to be able to use the new 'gene scissors', they often need to be introduced into the cells using old genetic engineering techniques in a first step (e.g. by using the so-called 'gene gun').

The results published in the paper are in stark contrast to the European Food Safety Authority (EFSA) assessments, which were recently published and put up for public consultation. Similarly to the biotech industry, EFSA comes to the conclusion that the new genetic engineering processes are not associated with new risks. This paper shows that the opinion of EFSA is not consistent with the facts.

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The EFSA consultation [3]
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Attachment	Size
Risk of genome editing.pdf [5]	182.82 KB

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