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Short Communication

Various Techniques Employed in Risk Assessment in Genetically Modified Crops

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DESCRIPTION

There has been no systematic risk assessment of Genetically Modified (GM) crops for human nutrition and health. Each GM crop or trait was evaluated using a variety of feeding periods, animal models, and parameters. The most common outcome is that GM and Non-GM sources induce comparable nutritional performance and growth in animals. However, some GM foods have been linked to negative microscopic and molecular effects in various organs or tissues. The diversity of risk assessment methods and outcomes reflects the subject's complexity. While there are currently no standardized methods for assessing the safety of GM foods, efforts to align are underway. More scientific research is needed to boost confidence in the evaluation and acceptance of GM foods [1].

Since the introduction of recombinant DNA technology in plant breeding, it has been necessary to define internationally standardized guidelines for assessing the safety of foods derived from GM crops. According to some experts, safety assessment is based on scientific principles and rigorous testing, and the requirements for GM plants have been more stringent than for any other food. Others, however, argue that it is based on very little scientific evidence, and that the testing methods recommended are insufficient to ensure safety. In general, any single method of safety assessment has strengths and weaknesses, and its strength is determined by the aggregate sensitivity and robustness of the evidence provided by different combined methods.

When the safety assessment process for GM foods was examined, some defects were discovered. The initial guidelines were intended to regulate the introduction of GM microbes and plants into the environment, with no regard for food safety concerns. They have however, been widely cited as providing authoritative scientific support for food safety assessments [2].

Another defect in assessing the safety of GM foods is the concept of substantial equivalence. When substantial equivalence for an organism or food product is established, it is considered to be as safe as its conventional counterpart and no further safety consideration is required. It is also critical to choose key compounds as well as genotypic and phenotypic variations of components to include in comparative analyses. Some low-content plant compounds with biological activity, on the other hand, may be unknown. As a result, methods for evaluating overall effects independent of composition are required.

The consideration that unintended consequences appear no more likely in GM crops than in conventional crops, as if GM technology is an extension of traditional plant breeding, has been a major issue in the risk assessment of GM foods. Unintended changes in GM crops, on the other hand, may affect metabolites other than those directly related to the transgene. Some GM crops, for example, have higher lignin content. As a result of its inability to detect unintended effects, substantial equivalence is not an acceptable method for GM evaluation. Unintended changes can theoretically be predicted based on information about the genetic construct's insertion site, gene regulation, gene-gene interactions, and potential interferences in metabolic processes [3].

As a result, appropriate detection methods are required, such as DNA analysis, DNA/mRNA microarray hybridization, proteomics, and chemical fingerprinting (metabolomics). These methods were not available at the start of GM production and are still not widely used to assess its risks. To demonstrate the safety of transgenic foods, all available options must be explored. The benefits of transgenic foods could provide solutions to many problems, but proof that these foods will not cause other problems is required first. Although numerous advancements can improve the reliability of GM food safety assessments, more research in other critical areas is required to develop new and more effective methods [4].

CONCLUSION

Advances in molecular biology, toxicology, biochemistry, and nutrition hold the promise of producing sets of genes and methodologies that can be used as biomarkers for a cell's reactions to toxins, allergens, or other compounds. They will aid in the development of new tools to aid in the advancement and evaluation of GM crops. The scientific priority is to improve human and animal health or natural resource management

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without jeopardising public safety. The next step in assessing the safety of GM crops is for regulatory agencies to adopt the developments and recommendations made by advisory committees convened by regulatory agencies and science organisations and published in scientific journals.

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