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Editorial

Biotechnological Purview of Genetically Modified Foods

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Several studies have revealed the genetic material is specifically transformed employing genetic engineering tools develop genetically modified organisms (GMOs) including microorganisms. such as bacteria and yeast, plants, insects, fish, and mammals excluding human [1-4]. It has been noticed that GMOs are recognized to be the major source to yield genetically modified foods concomitant with advanced scientific applications, and producing certain other non-food products. In current scenario it is quite obvious to develop the bridging between natural agricultural foods and modern designed foods [5]. As far as appropriate target of gene technology to plants and animals' is concerned, it appears to reveal more fascinating outcome as compared to that of routine and conventional selection methods, though with certain negative effects. This alerts the food scientists and food industries to be very cautious towards supplementation of nutraceuticals and development of designed foods, likely to check the overexpression of genes concerning with various chronic diseases consequent to life-style and western diet. Also, microRNAs (miRNAs), small noncoding RNAs have been reported to play pivotal roles in posttranscriptional gene regulation in animals including human along with regulation of their targets by translational inhibition and mRNA destabilization [2-6]. The nutraceutical or functional food supplementation for their specific expression in the organisms has been observed to be directly linked to speedy variations in diet as well modern lifestyle, ultimately resulting in variations heritability of the variant phenotypes. Mostly, the genetic code possessed by nucleated cells are known to be in specific coordination with particular nutraceuticals, and thus this linkage provides worth-interesting outcomes to combat against CAD, diabetes mellitus, central obesity and insulin resistance at younger age [3-6]. A multidimensional biotechnological purview of genetically modified organisms and thus developed foods is as follows.

During last two decades, a number of modern approaches have excelled in view of developing GMOs. The transgene has been reported to be incorporated into the genome of the recipients, documented as transgenic, and resultant organism as transgenic organism. Certain specific genetic engineering approaches like bacteriophage dependent transduction with the use of bacteriophages [6], pronuclear microinjection-based transgene injection [7], altered virus and plasmids associated gene transfer [8], and electroporation technique resulting in increased cell membrane permeability [9]. As a consequence of incorporation of genetic engineering tools in agriculture very interesting results concerning with speedy and accurate production of plants traits have been observed. Besides, agriculture has played a pivotal role in human advancement that is largely believed to concern the upgradation of plants and animals permitted humans to transform lifestyle all through the 'Neolithic Revolution'. 'The Green Revolution' or 'The Third Agriculture Revolution' was a period of technology transfer initiatives that led momentously augmented crop yields. These noteworthy changes in agriculture began in developed countries in the early 20th Century and spread globally till the late 1980s. Undoubtedly, genetic engineering techniques are much more precise [10] than mutagenesis, dealing with an organism's exposure to radiation and/or chemicals to generate a non-specific but then again steady change.

Genetically engineered crop plants have been well recognized to be resistant to majority of herbicides, and thus very effective in preventing environmental impairment by dropping the amount of herbicides required [12], ultimately controlling crop production cost-effectiveness together with minimizing the agricultural waste out. Fundamentally, plant scientists, well supported by outcomes of modern comprehensive of crop profile, reflect that crops modified employing GM techniques are less likely to have unintended variations compared to those in case of conventionally bred crops [13]. Consequent to further advancement, plant biotechnologists have been working enthusiastically to produce plants with genetically engineered resistance to crop specific infections [14].

In view of developing cold stress resistant varieties plants like potato and tobacco, an antifreeze gene from cold blooded animal basically fish has been documented to be successfully transferred into these plants [15]. Genetic engineering also resulted in producing plants likely to survive lengthy periods of cold, drought or salt stress [16]. Besides, results from a study have reflected the development of golden rice containing a remarkably high content of beta-carotene [3], though further research along this line of action is in progress in view of upgrading golden rice also with augmented iron content.

GM foods in context to human nutrition are fundamentally characterized based on their application and IPR regulation [17,18] as: (i) Genetically modified food like potato, soya, maize, tomato, sunflowers, rape, rice and melons, pumpkins; (b) Designed food comprising components of genetically tailored plants like starch, sugar, proteins, amino acids, oil, vitamins, antioxidants and minerals; (c) Functional food comprising of genetically adapted organisms. Furthermore, physicochemical profile can be altered in view of food fortification in terms of nutraceutical worth with improved content of essential amino acids, proteins and polyunsaturated fatty acids. The qualitative and quantitative worth of GM food production through biochemical and molecular level screening has been well correlated with checking and/or reducing the risk of life-threatening diseases, namely, allergies, malignancy and cardiac disorders [19]. On the contrary, drawbacks of GM foods may principally be categorized as: (a) Environmental Hazards; (b) Human Hazards; (c) Economic Concerns. In fact, it is quite pertinent whether the consumption of DNA in appropriate designed foods and their constituents can be conscientious [20]. Consequent to Genetic modification led re-assortment of sequences of nucleotides leaving their chemical conformation modest, DNA from GMOs is chemically consistent with to any other DNA. There is no confirmation that DNA from dietary sources has ever been integrated into the mammalian genome [20] studied the animal nutrition with GMOs. The toxin generates holes in their stomach and kills them. Genetic engineers take the gene, which that yields the toxin in bacteria and insert it into the DNA of crops so that the plant does the work, not the farmer. The point that human beings consume that toxic pesticide in every bite of Bt corn barely appetizing. Studies confirm, however that natural Bt- toxin is not completely destroyed during digestion and does react with mammals. Further, human intestinal flora may be rehabilitated into living pesticide factories, possibly producing Bt-toxin inside human system year after year, if Bt genes relocate to human gut bacteria. Further, these studies may include acute and repeated dose toxicology accomplishments and hypothesis- based testing.

Conclusion and Future Perspectives

Conclusively, the latest expansion of physiology and biochemistry with a special focus on genetic engineering and transgenic technology has a very huge number of latent uses in food production, comprising micro-organisms, plants and animals. Genetic alteration has augmented production in some crops. GM foods have numerous benefits like high return, salinity tolerance, insect resistance etc. GM foods have a lot of health impacts on living beings. GM foods have both positive and negative impacts. The work along these notions and objectives are in progress and may provide new insights into successfully approaching and satisfying the need for an economical, safer and efficient delivery system to be developed at a larger scale in the form of potential edible vaccines in developed countries followed by developing countries as well.

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