Book Review

Genetic Modification and Food Quality: A Down to Earth Analysis

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The development of recombinant DNA methods over the last 50 years has changed the food and feed industries dramatically. Crops that have been genetically modified (GM) are being cultivated in more and more countries and this process is likely to accelerate as desirable traits are identified and transferred to appropriate organisms, and as these are approved by the regulatory authorities. According to one estimate, global biotech crop plantings increased from 1.7 million hectares in 1996 to over 175 million hectares in 2013. The importance of biotechnology in the production of new crops for food and feed was recognized in the award of the 2013 World Food Prize to a team of scientists who made outstanding contributions to GM technology.

A necessary component of use of biotechnology in crop production is the need to ensure that the GM cultivars are as safe and nutritious for food and feed use as related, conventional cultivars. This assessment task is carried out by regulatory authorities in countries planning the cultivation and/or the importation of GM food products. The evidence used in these assessments indicates quite clearly that the approved GM foods and feeds are substantially equivalent to their non-GM counterparts in terms of their safety and nutritional composition. However, the technique has its critics who claim that modification of the genome of the plant (or animal) by GM technology may pose unknown and unacceptable risks to the human consumer. The fact that some consumers have concerns about the safety of GM foods is attributed by the authors to the fact that consumers have not been made aware of the extensive database of favourable findings.

This book is therefore welcome as the first comprehensive text on how GM production methods influence the quality of foods and feedstuffs, based on a complete and unbiased assessment of the scientific evidence. The coverage includes cereal grains, oilseed crops, vegetables, fruit, fish and animal products. The book should be a valuable reference text for a wide range of scientists in the food and agricultural industries, also non-governmental organizations, trade associations and consumer groups who are looking for an objective, balanced study of this issue.

In their assessment of the available scientific evidence the authors conclude that the approved GM foods and feeds are substantially equivalent to their non-GM counterparts in terms of their safety and nutritional composition. The data sets, representing over 100 billion animals fed GM crop products, did not show any findings of livestock health and productivity concerns. Also, the authors found no evidence of any differences in the nutritional composition of animal products derived from GM-fed animals.

These conclusions agree with assessments made by the world's leading scientific bodies, including the American Association for the Advancement of Science, the World Health Organization, the American Medical Association, the US National Academy of Sciences, the British Royal Society, and every other respected organization that has examined the evidence. The European Commission funded more than 130 research projects involving 500 independent research groups over 25 years and concluded that "There is, as of today, no scientific evidence associating GMOs (genetically-modified organisms) with higher risks for the environment or for food and feed safety than conventional plants and organisms".

The World Health Organisation stated that: "No effects on human health have been shown as a result of the consumption of such foods by the general population in the countries where they have been approved".

Asian countries will be particularly interested in the conclusions presented in this book, since they import substantial quantities of GM foods and feeds. For instance, by 2014 the Republic of Korea had approved the importation of a total of 136 GM cultivars of food and feed products including soybeans, corn (maize), canola, cottonseed, potatoes, sugar-beet and alfalfa. Approval was based on assessments carried out by the by the Korean Food and Drug Administration (KFDA).

As the authors point out, several reports claim to show evidence of safety concerns related to some GM foods. All have the same deficiencies: faulty design and experimental techniques, questionable statistics and more importantly no confirmation of the findings by independent scientists. The authors recommend, however, that these claims should not be dismissed completely but that other independent scientists should attempt to replicate the findings on a consistent basis. Confirmation of any safety concern would then have to be followed by re-assessment of the product by the regulatory authorities and possibly by revocation of approval of the GM product in question.

Overall, this book provides much needed scientific data concerning the safety and quality of GMO. It will help to address the consumer paranoia that is particularly salient in the pet food industry, where many consumers continue to strongly believe that non-GMO foods are safer and healthier.

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