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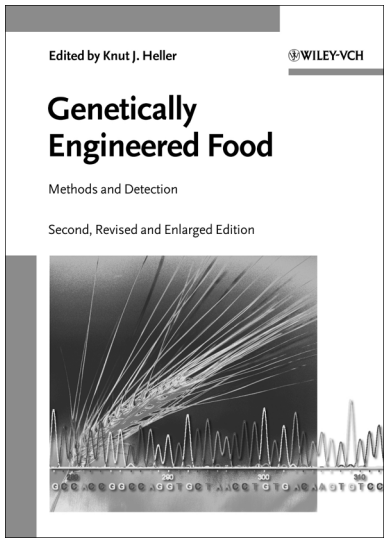

Genetically Engineered Food – Methods and Detection

Second, Revised and Enlarged Edition
Knut J. Heller (Editor)
Wiley-VCH, Weinheim, 2006, pp. 299
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The food we are eating today is not what people ate as recently as 15 years ago. Novel developments in the food industry, like the application of genetically modified organisms (GMO) either in food or feed or as technical ingredients became more and more important over the last decade. Recombinant modification of an organism employs modern molecular biological techniques. The first description of a recombinant DNA molecule was published around thirty years ago by Cohen and colleagues. This work served as the starting point for subsequent efforts in the development of advanced powerful molecular biology tools. In 1983, the pioneering work of Kary Mullis and colleagues, in particular, the development of the polymerase chain reaction (PCR) has opened hitherto unknown possibilities in genetics. As James D. Watson said in his book *Recombinant DNA* (1991) "The ability to isolate genes as molecular clones, the development of tools to modify gene sequences in the test tube, and the power to return altered genes to the organism to test their function have revolutionized the way genetics is done in higher organisms"; "There is no field of experimental biology that is untouched by the power we now have to isolate, analyze, and manipulate genes". It was quite obvious that these technologies have the potential to be used for food or feed production and that genetic engineering might replace classical breeding technologies in the future. The Flavr Savr tomato, a GMO with delayed cell wall softening during fruit ripening, was the first commercially grown genetically engineered food to be granted a license for human consumption by the U.S. Food and Drug Administration in the early 1990s.

The development of recombinant DNA technology and its application for food and feed production demands regulation by legislative authorities. In the European Union, this has been done recently by "Regulation (EC) No 1829/2003 on genetically modified food and feed" which replaced the former regulation concerning novel foods and novel food ingredients. In order to put the legislature into practice, methods for the quantitative identification of very low concentrations of GMOs or genetically engineered ingredients by regulatory authorities have been developed. PCR, the outstanding idea revolutionizing and overlapping all fields working with genetic information, is considered as the state of the art method to achieve rapid, sensitive and specific results in the detection and identification of GMOs in foodstuffs, additives, and processing aids.

Twenty six authors contributed to the book at hand, which has been edited by Knut J. Heller, and the editor has gathered well-known specialists in their respective fields to cover all aspects of DNA-based food engineering.

The book has a clear structure divided into three parts with thirteen articles based on more than twelve-hundred citations. The application of recombinant technology to food engineering, the legal implications resulting from such manipulations and the detection methods to enforce the legal requirements are covered by this textbook. In particular, part I presents applications and perspectives of genetic engineering in terms of using bacteria, fungi, plants or animals as food or as tools for the production of food additives or in food fermentation processes. The second chapter, written by Rudolf Streinz and Jan Kalbheim, provides a thorough insight into the legal situation for genetically engineered food in Europe.

The third part of the book describes methods used for the detection of genetic modifications. After a general introduction to DNA-based detection methods, the reader gets insight into methods of detection of transgenic fish, genetically modified crops and genetically modified organisms in composite and processed foods. Part of the third chapter is also a contribution dealing with the potential of altering the genetic background of *Lactococcus lactis* by classical techniques and by recombinant technology and methods for detection of such manipulations.

Most of the articles have a straightforward organization giving a short introduction and an overview of the field and ending with a conclusion or an outlook. The illustrations and the tables fit well to the text and a list of publications rounds off the individual articles.

In my view, this book is well suited for updating knowledge on genetically engineered food. Its format and presentation are excellent and it is an essential reading for all scientists and advanced students who are concerned with DNA-based food engineering.

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