

Title Nutritional Improvement of fruits and vegetables
Author J.J. Giovannoni
Citation Book of Abstracts, 2004 IFT (Institute of Food Technologists) Annual Meeting and Food Expo, 13-16
 July 2004, Las Vegas, Nevada, USA. 321 pages.
Keyword nutrition; fruit; vegetable

Abstract

Rapid advances in plant molecular genetics and genomics have and continue to lead to research discoveries with practical biotechnology applications. While a major fruit or vegetable crop genome remains to be sequenced, development of numerous genetic maps, breeding populations and EST sequencing has resulted in important knowledge for enhancement of fruit and vegetable quality. Numerous trait loci and in some cases corresponding genes have been identified with potential impact on important fruit and vegetable characteristics including flavor, appearance, shelf-life, and nutrient quality. Relatively few of these genes have been incorporated into fruit and vegetables via nonsexual genetic modification (GM) strategies, though numerous candidates for such approaches idle on the runway waiting for the eventuality when consumer and trade concerns subside. Several examples of such genes will be presented including those impacting fruit shelf-life and vegetable nutrient quality. While the release of new GM fruits and vegetable is virtually stagnant, the tools of molecular biology and genomics have nevertheless facilitated rapid advances in traditional breeding. In summary, the ability to detect and monitor genes in parents and progeny of breeding populations had facilitated the efficient selection of desirable traits ultimately transferred through traditional means and thus avoiding the current GM controversy. The identification of important trait carrying regions of plant chromosomes, the corresponding genes and the conversion of the resulting information into molecular markers had resulted in “natural” plant varieties developed with the tools of biotechnology. The ability to monitor the organization and origins of crop plant genetic material has resulted in the development of unique breeding lines and strategies, in some cases taking advantage of wild relative of given fruit and vegetable species. Several examples of both GM and breeding tools resulting from biotechnological innovations and used for fruit and vegetable improvement will be presented.