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ASIA EDITION

Biotech nutraceuticals is the way forward

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Biotech nutraceuticals is the way forward



Dilip Ghosh is director of NutriconnectFood has been used as a pharmaceutical agent to treat diseases since time immemorial and the pharmaceutical use of food is the basis of concept of nutraceuticals. Although there is no clear difference between nutraceuticals and functional foods, the basic difference between them is in the form in which they are presented.

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Biotechnology in food and nutrition business

The most ancient form of biotechnology is fermentation, which involves use of microorganisms such as yeasts for the production of wine, vinegar, and bread. Dairy products such as yogurt and cheese were produced by lactic acid bacteria and molds. Although these techniques are still used, the cultures that were used in ancient times have been modified to provide high-quality products with increased yield.

Modern food or nutraceutical biotechnology has evolved into a billion-dollar industry, with the promise of producing foods that provide functions beyond the basic nutrients they contain. These functional foods or nutraceuticals have become increasingly important to consumers who are interested in the health benefits of functional foods for prevention of illness and chronic conditions.

Recent development of nanotechnology and its limited application has revolutionized the entire chain of food and nutrition, particularly in the field of delivery and packaging systems.

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The reported benefits of the new biotechnologies span from reducing environmental damage to improvements in animal welfare, farm productivity, product quality, and human health but there seems to be hesitancy in adoption of such technologies by farmers and food companies.

Biofortification of staple crops through modern biotechnology can potentially help in alleviating malnutrition in developing countries. Several genetically modified crops, including rice, potatoes, oil seeds, and cassava, with elevated levels of essential nutrients; reduced levels of anti-nutritional factors; and increased levels of factors that influence bioavailability and utilization of essential nutrients are advancing through field trial stage and regulatory processes towards commercialization. The successful introduction of the biofortified crops would have a significant impact in reducing malnutrition and the risk of chronic disease in developing countries.

Consumers and regulation

An Australian study on consumer attitudes towards biotechnology has shown the consumers to have mixed, but on average, less positive attitude toward biotechnology. Many consumers in the US and elsewhere are unaware of the widespread use of biotechnology, the potential advantages of the genetic techniques, and the safety and regulatory procedures used before a product is approved for commercial use. The overall tone of public attitude towards novel food technologies is one of wariness, unease, uncertainty, and sometimes outright negativity.

There is no regulatory scheme for functional food per se, but functional food products are clearly subject to most of the federal regulations. If a functional food product is marketed for a therapeutic purpose (for instance, to treat a disease), it will be subject to regulation as a "drug." If a product is subject to regulation as a "food," it may be further classified as a conventional food, dietary supplement, food for special dietary use, or medical food, depending upon its intended use.

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The production of pharmaceuticals with recombinant DNA technology has enjoyed significant successes over a quarter century, with minimal controversy. However, the use of recombinant DNA-modified plants for food, feed, and environmental applications has not fared that well. These shortcomings have helped to generate "The Big Lie" that recombinant DNA technology applied to agriculture and food production is unproven, unsafe, untested, unregulated, and unwanted. Those misconceptions have given rise to unwarranted opposition and distorted public policy. The issue needs to be tackled globally with the help of academicians, regulators, industries, consumers, and policy makers.

Wellness

Breakthrough biotechnology research is providing new applications for nutraceuticals and functional foods in health and wellness platforms. Over the last few decades, nutraceuticals have filled the nutrient gap for consumer health but the level of science and discovery has been limited. "The needs of today's consumers are multidimensional and they are seeking optimal health, not medication," said a leading nutritionist. Advanced biotechnology tools that can provide greater science is now available to an industry that can deliver wellness and health quickly to the consumer.

It has been argued that biotechnology is neither good nor bad, and it has the potential to alleviate or aggravate the impact of agriculture on the environment to improve human and animal nutrition or to pose danger to human or animal health. The challenge is thus to develop, supply, and manage biotechnology for the benefit of humankind and the environment. The solutions proposed to tackle this challenge include:

1) Promotion of research and market development for life sciences and biotechnology applications and the "knowledge-based bioeconomy"
2) Fostering competitiveness, knowledge transfer, and innovation from the labs to industry
3) Encouraging informed societal debates on the benefits and risk of life sciences and biotechnology.
4) Ensuring a sustainable contribution of modern biotechnology to agriculture.
5) Improving the implementation of the legislation and its impact on competitiveness.