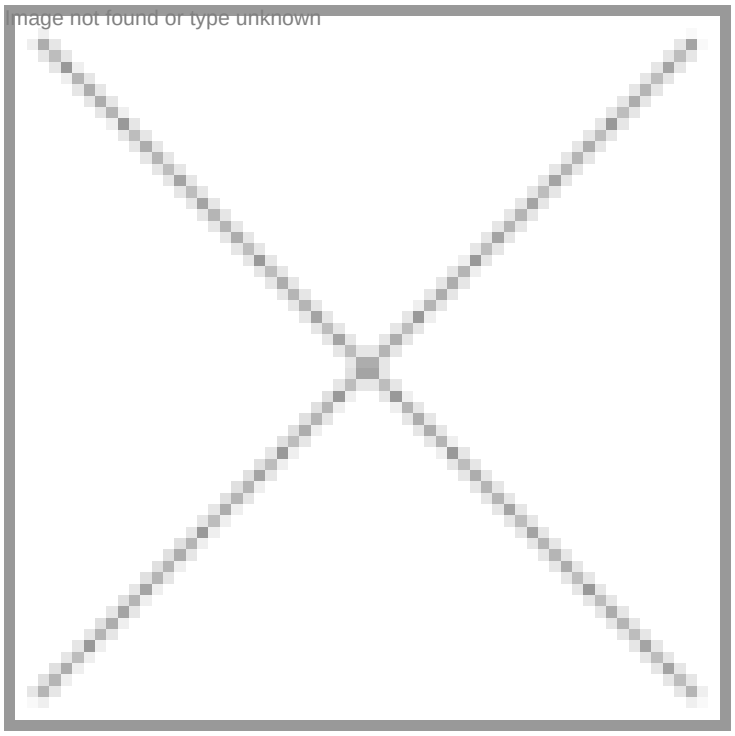
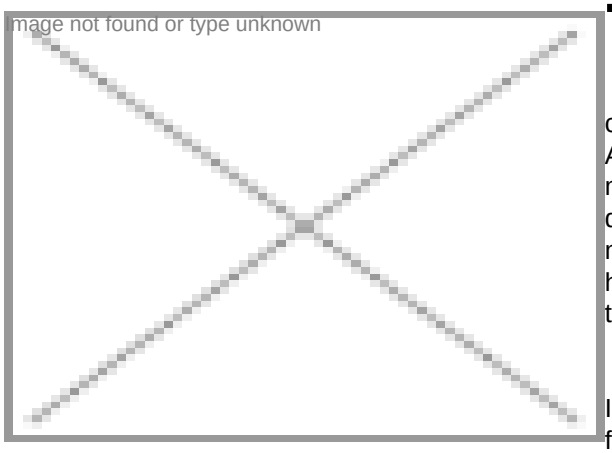
BioSpectrum the business of Bio & Health Sciences

Enzymes to boost food industry

09 May 2011 | News



With food fortification fast becoming one of the growing industry segments, enzymes emerge winners



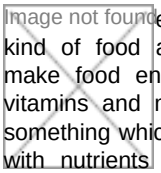
Though the Universal Declaration of Human Rights, established by the United Nations (UN) in 1948, identifies nutrition as a fundamental human right, malnutrition remains the biggest contributor to child mortality in the world. According to the Food and Agriculture Organization of the United Nations, there were nearly 217 million undernourished people in India at the beginning of the last decade. The scenario has not changed much. Fighting malnutrition, mostly through fortifying foods with micronutrients is one of the world's highest priority health issues. Researchers, worldwide, are working towards creating maximum nutrients in the minimum possible amount of

In the recent years, enzymes have emerged as the best possible solution for the Indian food industry. Using enzymes and genetic engineering, one can design plants and foods for the future depending on the requirements of the agriculture and nutritional sector.

According to Dr Rakesh Tuli, executive director, National Agri-Food Biotechnology Institute (NABI), Mohali “One can design plants or food as per the need and requirement of the society. We can design strategic crosses to express desired molecules in plants through pathway engineering and similarly, we can also create foods that have specific type of desired molecules. For example: Withania Somnifera (Indian ginseng) has different qualities acting as anti-tumor, antioxidant, antistroke, immunostimulant and immuno modulatory. But its real purpose remains confusing. Hence, with the help of genetic

engineering, we are trying to make the plant develop in such a way that it is good for one and not for other. This helps in defining a perfect purpose for it and thereby understanding the wealth of the plant." Novozymes is one such company which has been working on this pathway for the last five years.

"Enzymes are the future sustainable solutions for the Indian food industry. We have developed enzyme application in food segment successfully for the past five years. With the right collaborations one can develop the enzyme applications in new segments too," said Henrik Bisgaard, senior director, Innovation office, Novozymes, Denmark, at a seminar organized by Association of Biotechnology Led Enterprises (ABLE) and Novozymes. One of the leading companies in the enzymes segment, Novozymes creates bio-industrial products by using enzymes for various applications. The seminar discussed sustainable solutions for the Indian food industry using biotechnological tools.



"e need for availability of the right kind of food and adequate food. We should make food enriched with micro nutrients like vitamins and minerals. The biscuit industry is something which we can focus on by fortifying it with nutrients as it reaches every nook and corner of the country."

— Ms Vinita Bali
CEO, Britannia

Right from fortification to preservation, enzymes have wide ranging applications. "We can increase the shelf life of fruits, bread, vegetables using these methods. We can also increase antioxidants in plants, thereby, discouraging that the insects that feed on them. For example: The shelf life of tomato can be increased by 10 days using antisense gene of ACC oxidase from banana. Relatives of wheat with high content of iron and zinc, micronutrient fortification of banana, increasing the level of carbohydrate and proteins, creation of soft wheat from hard ones; should be brought forward," says Dr Tuli. NABI has already done projects on high micronutrient grains, low phytic acid grains, high accumulation of anti-oxidants, high amylose and low amylopectic grains and soft grain wheat with high yield for biscuit and cookies.

The need for a proper solution like this is a must for the food industry, especially in a country like India. According to studies, two out of three children and women have iron deficiency in India. The UN aims to reduce the number of women who die during childbirth by three-fourth and the number of children who die before the age of five by two-third, by 2015. The fortification of food with nutrients is needed to meet the objective.

According to Dr K Madhavan Nair, deputy director, biophysics division, National Institute of Nutrition, an arm of IndianCouncil of Medical Research (ICMR) based at Hyderabad, "We should enhance the genetic selection and production practices. The changes should be implemented right from the seed or root stage in crops to meet the requirements of the society. Methods to produce rice with improved iron content and other nutrients should be brought forward. The fortification of food with micro nutrients like iron, iodine, zinc, vitamins, copper is the need of the hour. One needs to come forward to support the cause of solving the issues like bio availability, absorption and utilization."

The companies are all set to welcome the new methods of food fortification and its benefits for the industry and people. According to Dr Shovan Ganguli, platform director, bioscience, nutrition and health, Hindustan Lever, "the food industry would surely grow with the change. It will also provide more job opportunities in the food processing industry. But safety still remains an issue which needs to be properly addressed before moving ahead." Hindustan Lever has products like Green tea in this segment.

Britannia, one of the leading companies in the food market also claimed that food fortification is the need of the hour. "There is a dire need for availability of the right kind of food and adequate food. We should make food enriched with micro nutrients like vitamins and minerals. The biscuit industry is something which we can focus on by fortifying it with nutrients as it reaches every nook and corner of the country. According to figures, nearly 60 percent of school going students are anemic in India," adds Ms Vinita Bali, CEO, Britannia.

"Food processing companies and biotech companies should come together to protect the health and nutritional needs of the weaker sections of the society. We are closely associated with the National Institute of Nutrition on this aspect. We have come up with iron-rich biscuits but the main problem is that only nine percent of the food consumption is of branded packaged food, the rest 91 percent is from the generally available non-branded food products. The major issue would only be solved once the entire industry starts on it together," Ms Bali states, while speaking on the trends in health food.

Even when the need and positive aspects of usage of biotechnological tools as sustainable solutions for the Indian food industry is preached on, the issue of safety still remains a major concern for Indians. The researchers are still not sure on the after-effects of the continuous intake of the genetically modified crops or food. With the National Biotechnology Regulatory Authority Bill (NBRAI) yet to be discussed in the parliament, all eyes are on it, for now.

Suchitra Pillai in Bangalore