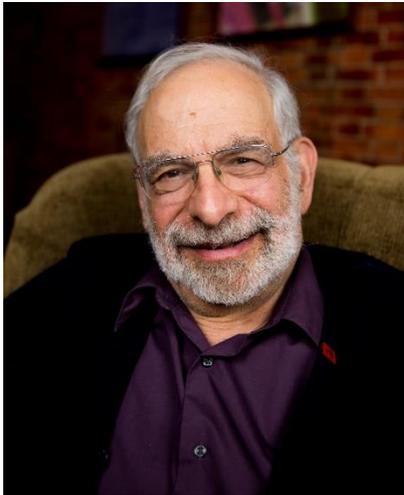


GUEST EDITORIAL



Prof. Joe Regenstein

GENETIC MODIFICATION OF CROPS AND AFRICA

An editorial by Joe M. Regenstein, Professor Emeritus of Food Science at Cornell University and the 2015 Institute of Food Technologists' (USA) Bor Luh International Award

Email: jmr9@cornell.edu

As the co-author of the recent book, “Genetic Modification and Food Quality: A Down to Earth Analysis”, I had the opportunity to work with Dr. Robert Blair as he carefully reviewed almost all of the peer reviewed literature concerning the food and feed-related issues that may be of concern with

respect to modern genetic modification of food crops. (The book does not review environmental issues.) What surprised me most about his thorough review of the literature was the almost total absence of negative effects of feeding animals genetically modified plants (GM) or microorganisms and of feeding humans either GM plants and microbes, or the animal foods resulting from feeding these GM materials to food animals.

Given that we know that microorganisms regularly exchange DNA and that this even sometimes occurs across species in plants and that has never had any obvious detrimental effects for humans, it is not surprising that the active movement of known genes by scientists also is not a problem. And for humans and animals to digest DNA does not seem to create any problems whether the DNA has been modified or not. On the other hand, the resultant products produced by the plant or microbe might have some issue – although again, the material produced by the genetic modification initially is a protein, and again the digestibility of protein may vary, but protein except in significant excess has not been a source of health and safety concerns. (Although getting sufficient, balanced protein remains a nutritional concern.) Obviously there are proteins that are allergens and under extreme conditions proteins may become prions. But so far any allergen proteins have been caught before any GM product was released and there is no sign of any relationship to prions.

However, in learning more about genetic modification as a food scientist working in a relatively unrelated area, I was surprised to learn about what we have done in the past to help the plant and microbe breeding process commercially. In some cases the seeds are treated with either mutagenic chemical or with radiation. The seeds are then grown and evaluated, but in fact, the possibility of “sleeper” changes in the gene structure that might only become important under circumstances not tested for remains a potential

concern. In fact, in my mind it raises many more concerns than the modern GM products.

Given Europe's fear of changes in their food supply and their devotion to the precautionary principle, such mutations I would have thought might be of concern. But no, I believe that changes due to mutagens and/or radiation go totally unregulated in every country of the world.

Yet when we take a known gene and make the transfer to another organism, and we then test it extensively, even if some of it is done to meet "voluntary" regulatory requirements – these products after having passed these tests are still not accepted. Any company that understands the "reality" of voluntary knows that voluntary is really not voluntary. And even the European Food Safety Authority has accepted a number of GM "events", the term used for an individual product.

Obviously each country has a right to accept or reject GM products being grown in their own country, but the effort in Europe to reject products grown elsewhere has now been rejected by the European parliament. Europe needs to feed its people and its inefficient food system is already making the price of food higher there than it ought to be. Had they accepted the idea that some countries could reject outside sources of food/feed would have raised the price of food even further making it harder for lower income people to be food secure. (And would have negatively impacted the whole concept of a EUROPEAN market.)

And this negative thinking of course does not take into account the benefits that current and future GM products will provide for farmers and consumers. Again consumers have not paid enough attention to the potential benefits that come indirectly when farmers can raise more crops on the same amount of land (possibly lowering prices) and are able to use less pesticides. The need for less land for agriculture will be more important as populations grow and more land is needed for alternate uses. It is also worth noting that the European Food Safety Agency has just indicated that they are comfortable that glyphosphate (Round-Up) is NOT a carcinogen.

So how does this affect Africa? A lot! The failure to obtain the full benefits of the latest modern agricultural research including much that is being done directly in Africa for crops unique to or very important to Africa simply decreases the effectiveness of programs to relieve hunger, expand and modernize agriculture, and make Africa the potentially rich continent that it has the potential to be. Current GMO worries for Africa were informed by European suspicions which are unjustified. Isn't it time that at least those in the scientific community speak up more to help change the discussion in Africa? South Africa, Burkina Faso and Sudan allow for open cultivation of GM crops. Recently, Kenya moved to allow for environmental release of Bt maize. It has been heartening to see some of the countries in Africa that have begun the process of moving forward to accept modern technology – just as over time we have accepted all sorts of new and "frightening" technologies in all sorts of fields. This change needs to be done systematically and does not negate the need to do it wisely, to continue to regulate both

GM and mutation/radiation products, and to continue to monitor each GM or mutation/radiation product after release to be sure that it is meeting all of the expectations.

Africa: The ball is now in your court.