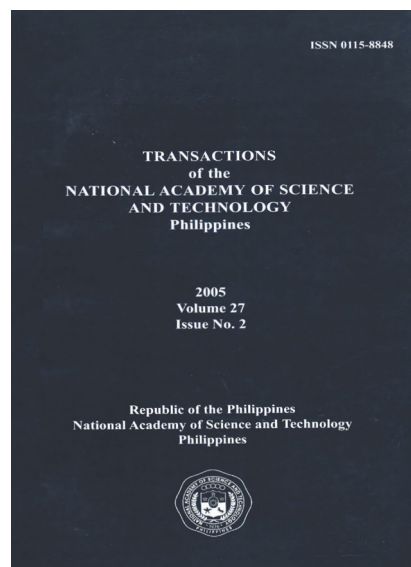


Transactions NAST PHL, is the official journal of the National Academy of Science and Technology Philippines. It has traditionally published papers presented during the Academy's Annual Scientific Meeting since 1979 to promote science-based policy discussions of and recommendations on timely and relevant national issues as part of its functions as a national science academy. Starting in 2021, this journal has been open to contributions from the global scientific community in all fields of science and technology.

---



## Modern Biotechnology and Other Innovations

Nina Gloriani Barzaga

Professor, Department of Medical Microbiology  
College of Public Health  
University of the Philippines Manila

---

### Citation

Barzaga NG. 2005. Modern biotechnology and other innovations. Transactions NAST PHL 27(2): 305-307. [doi.org/10.57043/transnastphl.2005.4665](https://doi.org/10.57043/transnastphl.2005.4665)

### Copyright

© 2005 Barzaga NG

## **Health and Nutrition Issues in Philippine Agriculture 2020**

### **MODERN BIOTECHNOLOGY AND OTHER INNOVATIONS**

**Nina Gloriani Barzaga**

Professor, Department of Medical Microbiology  
College of Public Health  
University of the Philippines Manila

In its assessment of Philippine agriculture, then, now and in the next 15 years, PA 2020 addresses the very core of what I see as a major driving force that will propel Philippine Agricultural growth to greater heights especially in having a positive impact on our nutrition and health.

Currently, we have a number of medicinal crops in the market such as *lagundi*, *banaba*, *ampalaya*, *noni* and *sambong*. These are produced through conventional plant breeding practices. They have not been refined but they have been put in table form so that they are more easily administered in relatively measured doses. This has become a multi million peso agri-medicinal product that has transformed our market in the pharmaceutical industry.

As a scientist affiliated with the health profession, I have also been for the last five years or so an avid advocate of biotechnology and have seen how we have commercialized in our country crops or food products of modern biotechnology which do not only increase yield but also reduce pesticide or herbicide dependence.

The integrated pesticide management that is practiced with the use of Bt corn and herbicide tolerant soybean has already reduced farmers' exposure to pesticide and more toxic herbicides. The planting of such pest resistant crops such as transgenic corn has also produced good quality corn kernels without the microbial toxin contaminants seen in traditional corn borer susceptible varieties. This would translate to reduced aflatoxin exposure which we know has carcinogenic potential.

I have also realized the tremendous potential that merging of agriculture, food biotechnology and medicine can bring. The agricultural sector has set

the pace for biotech industry in research development of genetically modified crops, controlled animal breeding and the production of transgenic animals. On the one hand, biotechnology will soon provide more and better agricultural products for producers and growers for food and feed. On the other hand, I see that it will expand crop or animal production options as more and more pharmaceuticals and industrial chemicals are produced in green plants as well as in animals.

We are going to see a real convergence of food biotechnology and human health therapy. PA 2020 with its vision and plans for technology development can make this happen in our country.

Other products of biotechnology that we use in testing microbial agents that may infect our livestock are those diagnostic tests that detect foot and mouth disease virus, avian flu, and prions that cause bovine spongiform encephalopathy or mad cow disease.

The modernization and upgrading of our laboratory capability as set forth in PA 2020 will certainly help us strengthen our quarantine procedures and surveillance for emerging diseases that have devastating consequences to human health. Thus, three points in PA 2020 that I think are most relevant to medical and food biotechnology and public health in general are the following:

On the first pillar of PA 2020— that of organizing and managing agriculture as a business. We can start seriously looking at ways by which we can apply our laboratory findings, our discoveries to commercial products of higher value. My talking point here is that of creating transgenic crop like tomatoes or bananas that have pharmaceutical properties. Such crop would have definitely added value and would expand productions options for farmers and generate livelihood. The idea is to think of producing and selling for example tomatoes or bananas expressing vaccine molecules. And we at UP Manila are working on just that, inserting the salmonella type A gene in banana or tomato. Using this edible vaccine as an example for the transformation of banana or tomatoes alone takes on new uses generating new product and using value-added processing that will make them sell more.

The second enabling strategy of PA 2020 is setting the relevant technological development direction that looks at primary production technology support and biotechnology. Technology innovations must be looked into at various stages of product development, at primary production,

distribution system and processing such as value-adding like concentrating active components, freeze drying, or making such products available in easy to use form and with attractive product presentation.

And third and last is the need to further put in place appropriate regulation. This includes establishing food product standards, safety and quality assurance, not only for food derived by modern biotechnology but also for use of plants as biofactories for pharmaceutical products.

In summary, the multitude of scientific discoveries and technologies that have the potential to make "Philippine Agriculture a way of life must be fully harnessed to produce beneficial human health products. These technologies may further blur the lines between agriculture and the production pharmaceuticals and health products but I believe, this may be the way to go. PA 2020 offers this as an option. Thank you very much and good day.

