

**Modalidade do trabalho:** Ensaio teórico

**Evento:** XXI Jornada de Pesquisa

## **FOOD PRODUCTION BY ECOLOGICAL CONCEPTS<sup>1</sup>**

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### **Introduction**

The genetic engineering is a relatively recent technology that allows taking DNA parts from one species and putting into other species, which starts to express the desired characteristics. However, strange genes can not be inserted directly in to one cell because they would be immediately eliminated by its defense mechanisms. To make possible the insertion of the genes, complex processes are necessary, like the agrobacterium transformation. The agrobacterium transformation is a process whereby the scientists insert strange genes in some virus, which can smuggle those genes inside the cells in to the DNA, without to be detected by the defense mechanisms (RODRIGUES, 2002). By this process, it can be produced a genetically modified organism.

### **Methodology**

This article arises from a bibliography analysis and its intention is informing key features about food waste in the modern society. In addition, this paper is seeking to intensify our critical sense to reflect on the food concept and the ways in which is wasted.

### **Results and discussion**

According to the World Health Organization (WHO, 2005), the genetically modified foods are derived from organisms that in its genetic material (DNA) were modified by a way that does not happen naturally ( ).

However, when we manipulate the genes from an alive organism, we do not have the entire dominium of what may happen. In other words, the possibility of being sent infectious and aggressive genes to a receptor organism is not excluded and these can recombine with the virus already existent, generating yet new and unknown specie (RODRIGUES, 2002). This is the starting point to the debate about what are the limits to be imposed to this kind of genetic manipulation, compared to uncertainties about the possible consequences to the living beings.

This preoccupation is recurrent and a bunch of authors express with less or more vehemence their opinions. In some cases the tone is very catastrophic, as following bellow:

( ) with the new techniques of ADN recombinant we can inadvertently create ecological watch pumps: some traces of organisms can take decades until manifest themselves, or it may simply that

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the organism needs decades to reach proportions of an invasive pest. A organism declared safe by an evaluation of short time can show danger in the future ( ). (RIECHMANN, 2000 p. 64).

Likewise, the risk of a genetic contamination are very dangerous because the transference of the genes between several species – virus or plasmids genetically modified can bring grave consequences because let us suppose that if these organisms are left on the nature, they would be hardly recuperated. In this case, new and powerful biological agents, such virulent bacteria, could transform themselves in parasitic genetic elements, in other words, they can infect cells, multiply each other, reproduce (RIECHMANN, 2000).

The agrochemical industry comes from the tow biggest world wars where powerful venomous were utilized as weapons of destruction against the enemies (LUTZENBERGER, 2012). Posteriorly, the chemical elements were adapted to be used in agriculture to exterminate all the agents that used to cause damages on the crops. Thus, ( ) the chemists remember that what kills people also kills insect ( ) (LUTZENBERGER, 2012, p. 53). Thenceforward, the utilization of these elements grew widely and as a consequence, its commercialization and production increased as well, especially by the results that were amazing. However, these elements were responsible for huge problems on the agriculture, because its utilization through a long time can devastate the crops and bring enormous consequences, impoverishing the environment and causing ecological imbalance.

By this context, Lutzenberger (2012, p.54) brings his contribution, affirming that:

The imbalance or the destruction of the soil s life by the abandonment of the organic fertilizing and right feeding s plant with soluble salts as well as the intense use of herbicides have as a consequence the increasing of susceptibility of pests and infirmities. Then the insecticides come up ( ). And when they are brought to the soil by the rain, they contribute to the destruction even bigger on the soil s life. The bigger organisms of the soil such as earthworm, maybe the best friend that the farmer can have, disappear completely. ( ) Acting directly over the plant, the pesticides, like venomous that they are, contribute still to the imbalance of the metabolism s plant. All this process enhances more the susceptibility to the pests and diseases ( ).

Genetically modified organisms can become allergenic or toxics. Those people who are neighbors of a transgenic crop, farmers, or even workers that fabricate biotechnology products are under the risk of suffering some kind of allergy. According with some studies made by the World Health Organization (WHO, 2005, p. 15),

( ) natural genetic transformation has been found to occur in different environments ( ). In addition, it has been shown that ingested DNA from food is not completely degraded by digestion, and that small fragments of DNA from GM foods can be found in different parts of the gastrointestinal tract ( ).

The farmer became dependent of the agrochemical industry, which has expended so much so that even during the agronomy classes the students are conditioned to utilize such chemical elements. Our universities are no longer universities, they are mere technical schools, and very weak ( ). (LUTZENBERGER, p. 35, 2012). So it is really necessary a social reeducation about ecology because our schools and universities should transmit the information and treat the problems and challenges that the world is passing through. They also have the obligation to pass consciousness on the people.

The soil is a living system, it is an aggregation where each living being plays its own function. In the soil we find earthworms, which are responsible for the phosphors production, now, if we put

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chemical fertilizers and pesticides on the soil, they have the power to kill the earthworms and it brings its consequences. Furthermore, in the soil we also find several elements left by the continuous process of life that exist in the soil. So,

( ) for example, there are special bacteria that take nitrogen out of the air and convert it into a form plants can use. There are special fungi that can get phosphorus out of the soil and bring it to plants, something plants have a difficult time getting themselves ( ). Even without these reactions, the fertilizers are salts that interfere with the cell walls of microorganisms, hurting and killing them. ( ) For pest control, it means creating plants, which are so healthy that plant predators won't attack them in the first place (insects and diseases need nutritionally imbalanced plants). (NAUTA, n.d.).

Complementing the understanding, to the Australian researcher Bill Mollison, the ecosystems act homogeneously, conquering the ecological balance and sustainability like, for example, the bees that help to pollinize the plants, the birds that control the pests, certain plants that appropriate the nutrients of the air and transform it in some kind of element that the others plants can utilize. So, it is perceptible that the ecosystem act harmonically and each element develop some kind of function. There is not, therefore, the need for the chemical intervention by the excuse of enhancing productivity (PERMACULTURA BRASIL, 2002). When we utilize mechanical agriculture and chemical fertilizer, we finally kill all the life inside the soil generating, as consequences, imbalances on the ecosystem.

Thus,

( ) the result is a broken system: soils drained of nutrients, poisoned waterways and the destruction of a precious diversity of crop varieties that have enabled human societies to thrive from the mountains to the coast for millennia. At the other end of the food chain, urban consumers, especially the poor, have little choice but to buy pre packaged food built devoid of nutrition. (GREENPEACE, n.d.).

We can see that the ideology kept on the discourse made by the agrochemical factories is all about profitability. One of the greatest arguments that the defenders of the genetic engineering is that the transgenic organisms came with the idea of ending the hungry on the world. However, by a critical vision, Riechmann (2000, p. 105) says that the real cause of hungry on the world is not about scarcity of food, but scarcity of democracy.

Therefore, we should not transform our planet in a laboratory as the same way that it is not a question of ethical that the human beings should be treated as Guinea pigs with the goal of keep an economic system greedy and to fulfill the transnational companies desires that impose their development paradigms world widely.

The results of biotechnological products bring deep implication about the balance between the State, global power and the relationship between science and democracy. Most of the consumers are lay people and so they deposit their confidence on the scientists that have the obligation to work with ethics, social responsibility and morale. Yet, most of the researches, conducted in many countries question whether such products are safe or not, showing as a result great concern and discontentment by the people who were interviewed about transgenic food.

The debated question is not about the development of Science but it is about the development of a more responsible Science. The idea that the technocrats transfuse in the lay people's minds is that only the specialist are authorized to take the decision concerning some aspects of the nature. By this bias is clearly evident that the democratic decision is defiled.

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The public participation has an important function to performance a reliable and conclusive evaluation of the risks, especially on those news and controversy situations. In other words, the evaluations of the risks lay on the politic, social and regulatory context. Politic science s specialists have recognized that the public participation is fundamental because it can reach scientifically and politically reliable outcomes. Scientific evaluations of the risk involve necessarily a preview selection of the objects and analytic attention, reflecting about what is collectively evaluated and so worthy of a possible protection. However, there is no guarantees that such technique reflects on more widely priorities and social values or even defensives approaches of such values without the adequate public consultation (WINICKOFF, et al., 2005).

Moreover, the production and cultivation of transgenic organisms does not have the goal of resolve the issue of starvation on the world, this because it going to take out more land from those farmers that develop subsistence agriculture to destine to the global market. Monsanto as well as other companies are trying to make that the world depends of their seeds, affirming that we all need their technology to end the hungry. Meanwhile, farmers all around the world are having huge damages because many people are poor and can not buy what was produced.

### Conclusions

In this sense, the ecological agriculture can replace the agriculture of exploration. It is evident, however, that the shift of the paradigm of the actual agriculture, based on the massive use of insecticides, pesticides, synthetic fertilizers, chemicals, devastation of nature, etc, together with the false idea of quick profits, will not bring immediate outcomes because it is going to take some time until the ecosystems can recover themselves from the chemicals that have been spread on them for many years. On the other hand, if this ideal situation is reached, it is going to bring enormous benefits not only for the environment but also for the economic and social issues.

By this context, the more plausible solution would be to combat the poverty by enhancing rends and consequently it would enhance the purchasing power and then it would be possible to buy more food. Improve infrastructures and choose for the organic agriculture with the appropriate technologies in smaller properties but organized nets or cooperatives of production and distribution of food would contribute better for the quality of food put on the table and at the same time it would allow the establishment of a production model fairer for the farmer. In complementation, this proposal would allow the adoption of a model more ecological and sustainable of agriculture and would also obey the biodiversity fundamentals, creating ecosystems where would be possible to obtain good quality of food without environment degradation, respecting the environment and conserving the fertility of the soil by utilizing more efficient mechanisms and natural resources.

**Key words:** Biotechnological products; Transgenic food; Agricultural paradigm.

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