

## Guest editorial

# Societal attitudes regarding GM food: the case of Poland within the European Union

**Tomasz TWARDOWSKI\***

Protein Biosynthesis Team, Institute of Biorganic Chemistry, Polish Academy of Sciences and Technical University of Łódź, 61-704 Poznań, Noskowskiego 12, Poland

## INTRODUCTION – BACKGROUND OF PUBLIC OPINION

When introducing new technology there will always be some controversies along with the benefits. There are many opponents of using GMOs in general, and GM food in particular. Although the list of benefits concerning genetically modified food is long, for some people the list of concerns is much longer. The disadvantages also refer to access and intellectual property issues, and many ethical concerns are also mentioned in the debate about genetic modifications. Thinking about society, we are concerned that new advances may be skewed to the interests of wealthy nations. However, we should remember that the biotechnologists are very responsible, and they were the very first to alert the society about the potential risks associated with genetic engineering.

## SOME ASPECTS OF POLISH AND EUROPEAN LEGISLATION

In order to understand the problem of GMOs in Poland, as well as in the European Union (EU), we have to consider both Polish and EU legislation. As for the EU, there are two core documents governing the access to the Common Market: Directive 2001/18 on the deliberate release into the environment of GMOs governs experimental releases and placement on the market, and regulation 1829/2003 on genetically modified food and feed. After going through all the evaluation procedures, a GMO is considered to be safe under European Law, and thus in principle can be commercialized throughout the EU.

The basic Polish legal act concerning GMOs is entitled “About GMOs” and is dated 22 June, 2001. However, a draft of new legislation was presented at the end

of 2007. But because this legislation was contradictory to EU Directives, the Commission was notified. Moreover, in the Acts on feed (22 July, 2006) and on seeds (26 June, 2003, with amendments) there are rules that are contrary to the European Directives. January 19, 2008 the Commission published a “Decision” (of October 12, 2007, number C (2007) 4697) saying that the new Polish legislation had no scientific justification. As stated in the Conclusion: The Polish notification does not provide any new scientific evidence. In the light of this Decision, the new Secretary of Agriculture (a new government was established in November 2007) declared that the Polish legislation will be modified to conform to EU legal standards. On May 5th, 2008, the Polish Government presented a new amendment to the “feed law”: GM feed will be “legal” in Poland until January 1st, 2012. Evidently, the harmonization of European law is a difficult task. However, unification of legal acts is an essential step towards the European bioeconomy.

## GENERAL, EUROPEAN AND POLISH FINDINGS CONCERNING SOCIETY ATTITUDES

The community of biotechnologists is deeply concerned with above issues, but what about society? The Food Marketing Institute surveys revealed the attitude of European society towards genetic engineering over several years (source: [http://www.ec.europa.eu/public\\_opinion/index\\_en.htm](http://www.ec.europa.eu/public_opinion/index_en.htm)). They showed that “in 1995 in the majority of European countries, one-third to one-half of respondents rated the risk of GE as a serious health hazard. Similarly, surveys in 1995-1997 found that 30% of respondents were opposed to GM foods [...]. More recent surveys, however, show substantial opposition in Europe.”

\* Corresponding author: [twardows@ibch.poznan.pl](mailto:twardows@ibch.poznan.pl)

The support for GM food in EU countries over the last ten years has decreased substantially. What can be the reason for this? “Further analysis has shown that this is due to a relative decrease in number of risk-tolerant supporters (...). In 2005 fewer people are prepared to discount the perceived risks of GM food against benefits.” Another unexpected result was that when talking particularly about GM foods, “only around 50% of supporters of GM foods said that they would be prepared to buy them”. The explanation may be that even this group would appreciate labeling of GM foods. This should make the governments aware of the fact that “the introduction of GM foods without labeling would be deeply unpopular across all sections of the public”. It was found moreover that the opposition in Europe to American GM exports is determined also by cultural values that reflect sensitivities to dread and unknown risk, personal experience and socio-cultural context (Finucane and Holup, 2005).

A recurrent topic in the GMO debate is citizens' access to a trustworthy information source. Firms that market GMOs and opponents are of course biased. Moreover, scientists are not recognized as independent experts, because most of them have to resort to industry for financing (which is not true in the case of Poland). Also, research publications are usually written using “difficult” language, with too many details.

Some groups of opponents would like to protect other people. However, they lack appropriate knowledge. Very often they manipulate mass media, using dramatic methods acting on the imagination. When we look closer, their arguments contain no rational support against GMOs. The old stories, for example concerning L-tryptophan, Pusztai's case or “killing” butterflies are popular. There are many campaigns for protecting Poland from GMOs, e.g. “STOP dla GMO w Polsce” (“Stop GMOs in Poland”). Since February 2006, 15 regions of Poland (all except one!) have signed documents declaring themselves GMO-free. In addition, there are now more than 300 farms from different parts of Poland declared as GMO-free zones. These declarations do not have any legal value, but, they are very striking when we are discussing public opinion. Poland therefore joins Greece, Hungary and Austria as the fourth country with (almost) complete “GMO-free” status. Polish environmentalists wish in this way to protect human health, biological diversity, high food quality, family farms and local economies from uncontrolled genetic experiments. In the case of Poland, in summary, one can conclude that in 10 years (from 1996 to 2007) the proportion of supporters and opponents was reversed: in 1996 over 70% of Poles were in favor of GMOs; in 2007 more than two-thirds of the public were against biotechnology, biotechnologists and biotechnology products (Lubiatowska-Krysiak and Twardowski, 2008).

In Poland there are many products with labels claiming that they do not contain GMOs (Fig. 1). They demonize food improved by biotechnology, and insinuate that their products are healthier. Unfortunately, these products are very often normal products without any “eco-advantages”, moreover, they may still contain high level of dyes, preservatives and herbicides or pesticides used during production.

## OPINION OF THE PRODUCERS – POLISH FARMERS – ON GMOS

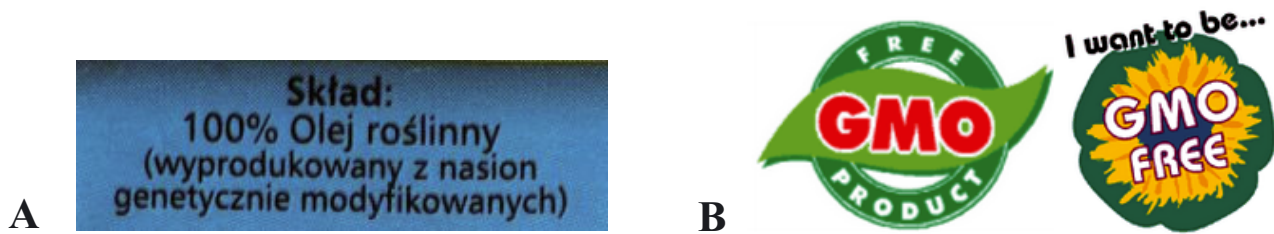
In 2006, a survey of the opinions of Polish farmers' (farms over 50 ha) on the GM plants they could cultivate was commissioned by the PFB (Polish Federation of Biotechnology) and was carried out by the PBS (Pracownia Badań Społecznych; Institute for Social Research). A complete report of the results may be found in Polish at the site <http://www.pfb.p.lodz.pl/>. Some of the results are presented here.

More than 70% of the farmers declared that they had heard about the cultivation of genetically modified crops. More than a half of the farmers questioned thought that GM plants are being cultivated in Poland, and more than 80% believed that such cultivation is conducted in the EU. Similar results were found regarding consumption in Poland and the EU of food made of or containing GMOs. Polish farmers considered that GMO cultivation will bring higher harvests (62%), better quality of the crop (29%), easier production and lower costs (both 23%). Only 16% did not have an opinion on this topic, and 5% claimed that there will be no advantages. Almost half the interviewees, asked about the biggest problems connected with GMO cultivation, answered that it is the lack of consumers trust in GM food.

This research shows that Polish farmers are familiar with GM plants, and they would like to cultivate them. At the end of 2007, the Polish Association of Corn Breeders stated that GM corn was cultivated on over 100 ha and over 300 ha in 2006 and 2007, respectively. Farmers are aware of benefits resulting from cultivations of GM crops, and know that the problem of consumer trust exists and is important. In 2007, a similar survey was performed. We observed increased percentage of farmers interested and positively focused (over 70%) on production of GM plants (Lubiatowska-Krysiak and Twardowski, 2008).

## SUMMARY OF PUBLIC ATTITUDES

The GMO discussion engages mainly scientists, environmentalists and politicians, to a lesser extent industry people, but the most important participants are the members



**Figure 1. Examples of common labels on Polish products.** A: Plant oil made from GM seeds (the text of the label: “100% plant oil; produced from the genetically modified seeds”; the label is in Polish). B: Information on GMO-free vegetarian products (these labels are commonly in English in Poland as shown on reproduction).

of the general public. We all are consumers and voters; first we vote in the supermarket, and we vote a second time during various elections (*e.g.* for members of parliament). The future of GMOs depends on social acceptance or rejection, as it is an element of the global market and will follow its rules.

We can try to explain the resistance of Europeans towards food biotechnology by considering three factors. First, we must consider the influence of the media. One popular view suggests that the content (either positive or negative) of media coverage shapes public perceptions in the corresponding direction. The second factor influencing public opinion is trust in regulatory procedures. European regulators have dealt with biotechnology as a novel process requiring novel regulatory provisions. They take into account a wide range of known and unknown risks. The last, third factor, is the role of knowledge in public perception. A large percentage of Europeans answered “don’t know” to questions about the applications of biotechnologies. There is evidence that information about potential benefits does improve consumer acceptance of GM food. This is confirmed in the wider sense in the Eurobarometer surveys ([http://www.ec.europa.eu/public\\_opinion/index\\_en.htm](http://www.ec.europa.eu/public_opinion/index_en.htm)), where biotechnology is perceived to have substantial benefits, for example, in health care, and thus it is supported for production of GM medicines, despite a level of risk. At the same time the majority of society is not satisfied with the available information.

## MEDIA

What is worrisome is that most people indicated public media as the source of information about the topic, and admit that most of the information is unclear. This may lead to disinformation of the society, as the materials presented on television, radio and in the press are usually in “concentrated pill” form, and not all aspects are discussed. Such sources of information create a misleading view of biotechnology and GMOs throughout society.

Quite often, an average person, not skilled in the art, just notices that two people from adverse parties are arguing – but the truth is – they do not really understand about what.

Undoubtedly, one of the major reasons for such a low public trust and the lack of knowledge about GMOs is the way lay people are informed about these issues. Unfortunately, the main sources of information are not educational institutions like schools or universities, but the media. We identified general information presented by the media as one of the most influential elements affecting public opinion. The sources of knowledge recognized by the Polish public were the following in 2005: 84% TV, 32% newspapers, 24% radio broadcast, 12% weekly and monthly popular science journals, 11% internet (survey commissioned by the Polish Federation of Biotechnology in TNS OBOP (OBOP = Osrodek Badania Opinii Publicznej = Center for Public Opinion Surveys), data not published). It is important to note that the availability of internet in 2008 increased to 40% of households in Poland. Today and in the near future we should expect continuous increase in the role of the internet. Among many web pages of “green organizations” we can distinguish three that tower over the others: those of Greenpeace, the International Coalition for the Protection of Polish Countryside (ICPPC; Międzynarodowa Koalicja dla Ochrony Polskiej Wsi, located and registered in UK), and the union of several anti-GMO organizations “Poland free of GMOs” (Polska-wolna-od-GMO). On the web pages of these organizations, all the information characterizes and describes GMOs as dangerous and even toxic for people, plants, animals and the environment. From these sites, one can download ready-to-send letters to the most influential people and governmental units expressing disapproval of cultivation and any other form of activity connected with GMOs.

Among thousands of web pages that were displayed as a result of our search, there were many fewer links that treated the positive sides of this issue, and their descriptions were much shorter. In addition, there aren’t many

organizations that are take steps to change this situation. The associations whose mission is to aid the development and popularization of Polish biotechnological achievements are Polska Federacja Biotechnologii (PFB; Polish Federation of Biotechnology) and the Biotechnology Committee at Polish Academy of Sciences (BC). One of few pages that are completely devoted to the matter of GMOs is <http://www.pfb.p.lodz.pl/>; on this website information from the PFB and BC are available.

## CONCLUSIONS AND DISCUSSION

From these results, we see that the level of Polish awareness of GMOs, genetic engineering and biotechnology is still taking form; it is still evolving and not yet unambiguous. More people have heard about GMOs, but still most of them regard the level of information they are provided with as not sufficient. We can expect that the importance and frequency of genetic modifications made in the USA, Canada, Argentina, Brazil, China and many countries in the EU will expand in the near future, and Poland, even unintentionally, must take this into account. It is highly possible that we will not be able to go without GM products, or otherwise that our products will no longer be competitive. As an illustration, let us consider an important feed component, soybean. GM soy constitutes 80% of the worldwide production of soy. Poland is a very important importer of soy – 2 million tons/year –, of which 99% is GM. Rejection of GM soy inevitably would lead to increased production costs of meat, milk, eggs, and poultry, as the cost of unmodified soy (as a short-supply commodity) will be very high, and there will be a very strong dependence on a limited number of suppliers. It is estimated that unmodified soy will be 15–30% more expensive than GM soy. Finally, Polish products will be less competitive on Polish and international markets. On the other hand, in a poll carried out for Greenpeace, in response to the question whether one would purchase meat or milk products knowing that GM feed was used for their production, as many as 48% of respondents strongly disagreed, 31% rather disagreed, 11% rather agreed and only 3% strongly agreed (<http://www.greenpeace.pl/>; <http://www.ekologiczna.pl/>).

Beyond question, the most powerful tool that should be more involved in the popularization of GMO issues is the media. There must be stronger cooperation between representatives of science and industry and the media, as information presented there has the highest impact on shaping the public standpoint. Another huge problem that must be solved is the high level of specialization, sophistication and inaccessibility of scientific language. For the majority of people, who are not educated in the biological sciences, proper understanding may prove difficult.

All the more, strong emphasis must be placed on proper “translation” of scientific knowledge and arguments into comprehensible, accessible information that may be easily conveyed to recipients *via* the media.

Another important matter concerning GMOs, frequently omitted, neglected or just left unsaid, is the legal status of GMOs in the EU. Poland as a member of the EU must respect and take into account community legislation, and be aware that enactment of laws in opposition to EU law (such as that proposed by the Polish as well as Greek, Austrian and Hungarian authorities to make a country a GMO-free zone) will not only be rejected, but also lead to a financial penalty imposed on Poland. If any of the EU countries wants to have different regulations, they must provide sufficient scientific evidence proving the negative impact of the GMO.

Unfortunately, the strongest attention to GMOs is paid because of GM food. This subject evokes a lot of emotions and controversies due to many reasons: food as the basis of our life concerns everyone; all of us are interested in its safety and quality; its production is one of the most important economic sectors. Critically important in the near future will be bioenergy and biomaterials. These aspects of the bioeconomy are not yet discussed publicly. However, the renewable biological resources will have to include GMOs. This discussion is facing us. Hopefully, in the nearest future for most of these critical issues a consensus will be found, but surely it will not be possible without reliable discussion.

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## REFERENCES

- Finucane ML, Holup JL (2005) Psychosocial and cultural factors affecting the perceived risk of genetically modified food: an overview of the literature. *Soc. Sci. Med.* **60**: 1603–1612
- Gaskell G, Allum N, Bauer M, Durant J, Allansdottir A, Bonfadelli H, Boy D, de Cheveigné S, Fjaestad B, Gutteling JM, Hampel J, Jelsøe E, Correia Jesuino J, Kohring M, Kronberger N, Midden C, Nielsen TH, Przystalski A, Rusanen T, Sakellaris G, Torgersen H, Twardowski T, Wagner W (2000) Biotechnology and the European public. *Nature Biotech.* **18**: 935–938
- ‘Genetically Modified Foods and Organisms’ from [http://www.ornl.gov/sci/techresources/Human\\_Genome/elsi/gmfood.shtml](http://www.ornl.gov/sci/techresources/Human_Genome/elsi/gmfood.shtml)
- Legal act “About GMOs”, dated 22 June, 2001 (Dz. U. Nr 76 poz.811)
- Lubiatowska-Krysiak E, Twardowski T (2008) Farmers opinion about GM Plants. *Biotechnologia* **8**: 131–141
- Twardowski T, Janik-Janiec B, Anioł A (2005) Polish mistrusts genetic engineering. *Euro. Biotech. News* **4**: 28–30