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"GMO" maize and public health

A little case of Schumpeterian policy in the EU

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- The current double standard that EU lawmakers apply to agricultural “GMOs” is simple: cultivation is generally forbidden; importation (as feed) is necessary.
- The only “GMO” currently approved for cultivation is a variety of *Bt* maize: for many years, most EU politicians successfully fought against the actual use of that cultivar, while the various attempts to block it – mostly resorting to the “safeguard clause” – were considered unacceptable by the EFSA, the EU Court of Justice, and the Commission itself.
- In particular seasons, the level of noxious fungi (fumonisins) contained in “non-GMO” maize varieties harvested in some European countries exceeded the legal limits; rather than liberalizing the use of “GMO” maize, which is safer than traditional ones, EU decision-makers chose to raise the threshold for the poison.
- This may be considered a minor but not insignificant case of “Schumpeterian” policy, where public choices are not inspired by a science-based mind-set, but are substantially dictated by a calculus of consent: most probably, EU politicians reckoned that an adjustment of the legal level of contaminants would have cost them less than the possible outrage deriving from encouraging “GMO” cultivation.

Author’s bibliography

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From this comprehensive book, several chapters are being translated into English and published in scientific journals:

The nonsensical GMO pseudo-category and a precautionary rabbit hole

Nature Biotechnology, Volume 33, Number 9, September 2015, p. 9-10

The meaningless pseudo-category of “GMOs”. The trouble with the “new techniques” for genetically modifying crops demonstrates the illogical process-based definition of GMOs in EU regulation

EMBO Reports (the official journal of the European Molecular Biology Organization), Vol. 17, Number 1, January 2016, p. 10-13

No biotech method is inherently safe - or unsafe. And this is irrelevant

Letter to *Science*, 23 February 2016

The Precautionary principle: Its misunderstandings and misuses in relation to "GMOs"

New Biotechnology (the official journal of the European Federation of Biotechnology), Volume 33, Number 4, 25 June 2016, p. 437-439

Nature as a totem, “GMOs” as a contemporary taboo

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The necessary “GMO” denialism and scientific consensus

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European ongoing incoherence on “GMO” cultivation vs. importation

Nature Biotechnology, forthcoming

The Central Dogma, “GMOs” and Defective Epistemology

History and Philosophy of Life Sciences, forthcoming

The EU Legislation on “GMOs” - Between Nonsense and Protectionism

Paper to be presented at the XX ICABR Conference (International Consortium on Applied Bioeconomy Research), "Transforming the Bioeconomy: Behavior, Innovation and Science", Ravello (Italy): 26-29 June 2016

“GMO” maize and public health – A little case of Schumpeterian policy in the EU

Abstract

EU lawmakers have been successfully struggling for a quarter of a century to refuse the cultivation of “Genetically Modified Organisms” on the Old Continent. A clear example is given by the revision of the accepted level of contaminants in maize: rather than admitting that Bt maize is safer than “non-GMO” varieties, and therefore European farmers should be allowed not only to import it, but also to produce it, politicians have raised the threshold of the poisonous fumonisins that may be legally present in food and feed.

This decision is an example of a “Schumpeterian” approach to policy, where public choices are not inspired by a science-based mind-set, but are substantially dictated by a calculus of consent: most probably, EU politicians reckoned that an adjustment of the legal level of food poison would have cost them less than the possible outrage deriving from encouraging “GMO” cultivation.

Keywords: GMO maize; Fumonisins; EU biotech regulation; Schumpeterian policy

JEL codes: K32 Environmental, Health, and Safety Law; Q18 Agricultural Policy, Food Policy

1. Background

The European prohibitionist approach to so-called “Genetically Modified Organisms” led to disruption of the international market: in the years around the turn of the millennium, the block on the commercialization in the EU of certain genetically engineered agricultural products, appealing to the alleged inherent riskiness of “GMOs”, triggered recourse to the WTO by countries which claimed that their exports were unjustly discriminated. The EU lost the dispute (World Trade Organization 2006.

Bernauer and Aerni 2008) and authorized the import of quite a few DNA-recombinant crops and vegetables, but did not stop prohibiting the cultivation of them¹ – sort of a *de facto* compromise.

Therefore, a clear double standard is currently applied in “GMO” EU politics: on the one hand, we see the persistent refusal to allow the *cultivation* of DNA-recombinant cultivars; on the other, there is a regular, huge stream of *importation*, above all “GM” soybeans and corn as animal feed, accounting for several million tons annually. European farmers are not allowed to grow GE [genetically engineered] crops, even if they are identical to imported cultivars; apparently against all logic, numerous products are “safe to eat, but only if imported”! (Masip et al 2013, p. 319) The paradox by which the cultivation of “GMOs” is substantially banned in Europe, while enormous quantities of recombinant DNA cereals and legumes are imported to be used as feedstuff, can be explained: cultivation of them is prohibited in order not to harm the old-fangled products of EU farmers (Graff, Hochman and Zilberman 2014, p. 13-14), to gain the political and electoral consensus of “organic” food producers, to protect the interests of the traditional herbicide/pesticide chemical industry (Zilberman et al. 2015, p. 215) and to appease the “anti-GMO” brigade; it is necessary to import them to allow animal breeders to work. Europeans must hope that there are no significant drops in the availability of “GMO” animal feed for import, or very serious economic problems would occur, as the European Commission itself warns (European Commission 2007a).

¹ The EU’s official list of authorized “GMOs” is not so short: 58 items were imported until recently, plus 19 cleared on 24 April 2015 (http://europa.eu/rapid/press-release_IP-15-4843_en.htm, accessed 8 August 2015), and some 40 requests are still pending; but for all the cultivars - except maize MON810 – use (importation) is allowed for “Marketing of food and feed and derived products”, “with the exception of cultivation”: http://ec.europa.eu/food/dyna/gm_register/index_en.cfm (accessed 8 August 2015).

The costs of such schizophrenic rules are shown by a particularly bizarre example: “Extraordinarily, in Romania before they joined the EU, GM soybeans were extensively grown and exported to Europe. Since they joined the EU, Romania is now forbidden to grow GM soy as it is not authorized for cultivation in Europe. Instead, the EU pays farmers in Brazil, Argentina and US to grow GM soy, and provides subsidies to Romania from regional funds.” (Baulcombe, Dunwell, Jones et al. 2014, p. 35) The path of special regulation for “GMOs” took the form of two Directives in 1990; the one regarding agricultural products is 90/220 (European Community, 1990), whose approach was broadly reiterated, a decade on, in Directive 2001/18 (European Union, 2001), regarding “deliberate release into the environment” (i.e. cultivation); a partial change was introduced by Directive 2015/412 (European Union, 2015), but its significance is outside the scope of this article.

The method of systematic obstructionism has worked. Indeed, since 1998 the EU has approved the cultivation of just one recombinant DNA variety, Bt corn MON810 (European Commission 2013), which has not stopped various countries constantly blocking it with legalistic quibbles and bureaucratic hurdles, or even (illegally) banning it. For example, the EU Court of Justice condemned France twice: 1. Court of Justice, case *C-419/03 of 15 July 2004, Commission of the European Communities against French Republic, OJ C 275 of 15 November 2003*, where the Court of Justice held that France had infringed Community law by failing to transpose Directive 2001/18/EC. 2. Court of Justice, case *C-121/07 of 9 December 2008, Commission of the European Communities v French Republic, OJ C 95, 28 April 2007*, in which France was condemned for failing to comply with the previous judgment (Mereu 2012). Various national governments have imposed this constant opposition by appealing to the only legal instrument apparently available until 2015, the “safeguard clause” (European Union 2001, Art. 23), by which an EU Member State can refuse a “GMO” only when there are well-grounded reasons which are scientifically proven by adequate studies regarding the negative impact of the product on the environment and/or on human health. The European Food Safety Authority is

responsible for assessing the grounds claimed by governments; it has regularly declared as invalid dossiers which this or that country has presented (for MON810, see European Food Safety Authority 2009. The ban by the German and French governments is discussed in Riccroch, Bergé and Kuntz 2010).

The EFSA's outcomes were only to be expected: "The main conclusion to be drawn from the efforts of more than 130 research projects, covering a period of more than 25 years of research, and involving more than 500 independent research groups, is that biotechnology, and in particular GMOs, are not *per se* more risky than e.g. conventional plant breeding technologies." (European Commission 2010a) However, since the opinion of the EFSA, even if it is required by law, does not green light products when unjustified requests to block them are rejected (unlike the situation, for example, with similar American agencies), in many cases the «safeguarding» countries have preferred to risk an infraction procedure – which in any case the European Commission, for political and diplomatic reasons, is very slow and reluctant to implement – rather than give "GMOs" their due go-ahead.

To be clear, the Commission itself declared that the "anti-GMO" manoeuvres of certain EU countries are inappropriate: "The fact that Member States have currently no margin of appreciation on cultivation of authorised GMOs has led in several cases some Member States to vote on the basis of non-scientific grounds. Some of them have also invoked the available safeguard clauses, or used the special notification procedures of the Treaty under the internal market, as ways to prohibit the cultivation of GMOs at national level." (European Commission 2010b) Such instrumental use of a clause that was designed for other purposes has been blamed again by the same European Commission, which underlines that no negative data have emerged regarding any genetically modified product previously authorized: "No Member State which had adopted a so-called "safeguard clause" had ever been in a position to put forward new evidence." (European Commission 2015)

2. The little trick

We will now look at a terribly toxic phenomenon: we will see how the diehard “anti-GMO” stance of Europe’s politicians can inspire regulatory approaches that explicitly increase some small but significant risks for public health.

Fumonisin² are powerful mycotoxins, i.e. a highly poisonous product from microscopic fungi: only discovered in the late 20th century, their carcinogenic effect has been confirmed in horses, pigs, rats and in humans; ingesting such moulds – among other possible pathological consequences – can generate neural malformations in the foetus, increasing the probability of the child being born with spina bifida. The ecological mechanism by which such substances become a real danger is easy to understand: a pestilent butterfly feeds on corn, deposits faeces where fungi of the *Fusarium* genus abound, especially in the small cavities of the grains that have not been completely consumed. Whatever and whoever feeds on the contaminated corn can suffer serious consequences; worse still, the toxic substances can pass into the milk produced by mammals who have digested them. Externally applied pesticides have a limited impact, because it is difficult for them to reach the well-hidden target; moreover, the epidemiological incidence is much higher in poor countries, where the cereal is consumed in abundance and where, at the same time, the price of insecticides and fungicides can be prohibitive for farmers. Bt corn substantially reduces the infestation, for one very simple reason: many of the insects which start to feed on it do not live long enough to generate the holes in which the fungi can take root. (Kaplan 2000. Kershner 2006. Ostry, Ovesna, Skarkova et al. 2010. Pazzi, Lener, Colombo et al. 2006)

As can be imagined, in many nations healthcare provisions establish clear limits to the acceptable levels of fumonisins in corn destined for human and animal consumption, and impose strict

² http://en.wikipedia.org/wiki/Fumonisin_B1 (accessed 8 August 2015)

controls. The quantity of toxic substances present in maize varies significantly, depending in part on the climate (it is relatively higher in hotter countries) and above all on seasonal weather trends (higher temperatures encourage the proliferation of the insects that accompany moulds).

Europe established contamination limits in 2001, then in 2005 (European Commission 2005), and then again in 2006 (European Commission 2006), to come into force on 1 October 2007. But here we must insert a disturbing tale. Corn crops in recent years, in particular in Italy and France, show a level of fumonisins which makes it impossible to use most of the product for human and animal consumption: the consequent obligation to send hundreds of tons to be destroyed or, in the best case scenario, to produce energy, is a source of serious damage for agricultural firms; for this reason politicians in Italy and France would have liked greater flexibility on the thresholds of the contaminants (for Italy, see Camera dei deputati 2007). As a result of the Italo-French pressure, the EU Food Chain and Animal Health Committee unanimously recommended raising the tolerance levels for fumonisins (European Commission, 2007b); the related regulation with looser limits was approved *in extremis*, two days before the coming into force of the law it was amending (European Commission 2007c). Probably this decision does not entail a significant risk for consumers, because the new levels should still be low compared to the threshold for real toxicity, but what we want to stress here is the ineffable style – for want of a better word – of the political decision, which can be summarised as follows. 1. There are thresholds for tolerance to certain natural poisons, established on scientific bases. 2. In some seasons, it is found that an agricultural product exceeds these thresholds. 3. Instead of banning the consumption of the illegal foodstuff, which would entail significant economic losses, let's raise the allowed toxicity limits: in other words, we choose what seems to be the lesser evil.

But let's go back for a moment to point 2. The presence of unacceptable levels of moulds is not a law of nature; a cultivar which is similar to those varieties which are attacked by pests exists, it is indeed the only "GMO" authorised for cultivation on the Old Continent (Bt MON810 corn). The only

field trial which has been carried out in Italy, by experts from a public organisation, showed that such cultivar was much less subject to the deadly phenomenon; a row even erupted over the late dissemination of the data: the malicious think, probably rightly, that if the results had been unfavourable to “GMOs”, they would have been published immediately and with a lot of fanfare in the media. This is despite the fact that the cultivation of this cereal in the fields of the EU is very limited and endlessly hindered by the laws of almost all the individual Member States, which are at the limit of European legality or even go well beyond what is legal.

In this specific case, in order not to encourage the use of a “GMO”, which moreover is theoretically authorised, the choice is made to “play” on the legal limits of the higher toxicity, which is frequent in the traditional product. It’s either one thing or the other: either these politicians display culpable ignorance or adroit bad faith; we suggest the latter, because European rulers know that the cereal whose *cultivation* they are blocking is *imported* in huge quantities for use as animal feed.

A cheap dirty trick of toxic politics is served...

3. A case of “Schumpeterian” policy

Why did EU office-holders refuse to embrace a science-based approach in this policy decision, and rather opted to adjust the legally admitted levels of food poison? Rational observers must be very perplexed, if they are not aware that public choices are often dictated by a different kind of logic: politicians will always proclaim their approach to be inspired by the search for common good, but a much less idealistic reading was proposed decades ago by Joseph Schumpeter, when he argued that, in a democracy, any political or administrative action is a mere corollary of the opportunistic estimates which every law-maker adopts! "The democratic method produces legislation and administration as by-products of the struggle for political office" (Schumpeter 1942, p. 286). It is impossible to escape the

clear impression that such a disposition is applicable in our case, and maybe most "normal" politics falls into the narrow definition highlighted by the great economic-political thinker.

Another quotation may reinforce understanding the mind-set which leads to such apparently illogical policy decisions: "Politically speaking, the man is still in the nursery who has not absorbed, so as never to forget, the saying attributed to one of the most successful politicians that ever lived: «What businessmen do not understand is that exactly as they are dealing in oil so I am dealing in votes»." (Schumpeter 1942, p. 286) Crude but truthful realism, which explains and exposes policy outcomes substantially dictated by a calculus of consent: most probably, in our case EU politicians reckoned that an adjustment of the admitted threshold of maize contaminants would have cost them less than the possible outrage deriving from encouraging "GMO" cultivation. An exquisite example of political expediency.

We could also call it a para-Machiavellian approach: if the end is to conquer and/or maintain power, and in democracy this means anticipating the probable reaction of public opinion (read: voters), it is easy to link a means to an end: avoiding the fury of the "anti-GMO" brigade was worth a decision which sets science aside, while at the same time those affected by the consequences (consumers, farmers interested in better seeds) were not expected to protest too much. They did not.

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