

The Two Layers of Food Safety and GMOs in the Hungarian Agricultural Law

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Abstract—The study presents the complexity of food safety dividing it into two layers. Beyond the *basic layer* of requirements, there is a more demanding *higher level* linked with quality and purity aspects. It would be important to give special prominence to both layers, given that massive illnesses are caused by foods even though officially licensed. Then the study discusses an exciting safety challenge stemming from the risks of genetically modified organisms (GMOs). Furthermore, it features legal case examples that illustrate how certain liability questions are solved or not yet decided in connection with the production of genetically modified crops. In addition, a special kind of land grabbing, more precisely land grabbing from non-GMO farming systems can also be noticed as well as a new phenomenon eroding food sovereignty. Coexistence, the state where organic, conventional, and GM farming systems are standing alongside each other is an unsuitable experiment that cannot be successful, because of biophysical reasons (such as cross-pollination). Agricultural and environmental lawyers both try to find the optimal solution. Agri-environmental measures are introduced as a special subfield of law maintaining also food safety. The important steps of agri-environmental legislation are aiming at the protection of natural values, the environmental media and strengthening food safety as well, practically the quality of agricultural products intended for human consumption. The major findings of the study focus on searching for the appropriate approach capable of solving the security and safety problems of food production. The most interesting concepts of the Hungarian national and EU food law legislation are analyzed in more detail with descriptive, analytic and comparative methods.

Keywords—Food law, food safety, food security, GMO, agri-environmental measures.

I. INTRODUCTION

AFTER World War II the quantitative food production began to be intensively supported in the European Community with the aim of recreating food security, practically having something to eat at all. However, by the 1990s the EU went from one extreme to the other, an overproduction crisis (eg. real hills of butter) emerged. Agri-environmental measures were introduced as an excellent management means of overproduction and maintaining food safety. In this context, the requirement of food safety became promoted as a new priority. By the 1990s the EU citizens also were already interested in the issue of food safety and quality, as well as the protection of consumer's interests was of increasing concern to the general public. At this juncture GMOs also emerged as a carrier of new kind of modern food uncertainties.

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II. THE OBJECTS OF REGULATION: THE TERMS OF FOOD AND FOOD SAFETY

According to the EU food law (also adopted by the Hungarian law) *'food'* or *'foodstuff'* means any substance or product, (even if it is unprocessed,) „intended to be, or reasonably expected to be” (it is a common law expression) ingested by humans. It includes chewing gum, drink and any substance, including water, intentionally incorporated into the food during its manufacture or treatment or even during cooking [21, Article 2]. There are so many kinds of food that positive list cannot be made, thus a negative list completes the definition (just like the list of Moses on things not to be eaten in biblical times): „Food shall not include feed; live animals unless they are prepared for placing on the market for human consumption; plants prior to harvesting; medicinal products within the meaning of Council Directives 65/65/EEC and 92/73/EEC; cosmetics within the meaning of Council Directive 76/768/EEC; tobacco and tobacco products within the meaning of Council Directive 89/622/EEC; narcotic or psychotropic substances within the meaning of the United Nations Single Convention on Narcotic Drugs, 1961, and the United Nations Convention on Psychotropic Substances, 1971; and finally residues and contaminants” [21, Article 2] are not to be considered as food as well.

The general principle of food safety requirements is “that food shall not be placed on the market if it is unsafe. Food shall be deemed to be unsafe if it is considered to be either injurious to health or unfit for human consumption” [21, Article 14]. A contrario, the Hungarian Act on the food chain and its official control defines food safety as “*the harmlessness to human health and the suitability for human consumption* of the food product in line with Regulation (EC) No 178/2002” [1]. It is interesting that the Chinese Food Law [6, Article 150] finds the most precise definition according to which “Food safety” means that “food is nontoxic and innocuous, satisfies the necessary nutritional requirements, and is free of any acute, sub-acute, or chronic hazards to human health”.

It must be emphasized that food safety is naturally tightly related to “the level of information, knowledge on food safety among managers and food safety practices” [12], especially the *proper hygiene practice*. This coherence is reflected already in the title of the *Food Safety and Hygiene Regulations* of England 2013 for example. Hygiene belongs to the first, *basic layer* of food safety.

III. THE TWO LAYERS OF FOOD SAFETY

A. The First Layer

Food safety, of course, requires a uniform level of demands; yet two layers can be distinguished. The first level is the authorized, official one, fixed in norms at the present state of scientific knowledge. This *basic layer* of requirements is to avoid people becoming sick, not suffering from serious symptoms or after-effects, and especially not to die for a few hours, days or weeks due to the effect of a hazardous ingredient, in short “hazard” such as broken pieces of glass or food pathogen (e.g. *Salmonella*, *Escherichia coli*, etc.). These are unfortunately common cases; outbreaks are almost continuously reported in several countries of the world.

‘*Risk*’ is always a consequence of a hazard in a food. It is a function of the probability of an adverse health effect and the severity of that effect, consequential to a ‘*hazard*’, which latter means a biological, chemical or physical agent in, or condition of, food or feed with the potential to cause an adverse health effect [21, Article 3 point 9. and 14] and – as can be seen – is not a rare phenomenon.

According to Cogan, food is really our most dangerous consumer product, and our governments do not fully protect us from its perils [7, p. 1495]. The Centers for Disease Control and Prevention of the U.S. Department of Health & Human Services estimate that “48 million people get sick, 128,000 are hospitalized, and 3,000 die from food borne diseases each year in the United States” [4]. Annually, this is the burden of foodborne illnesses caused in – modestly speaking – one of the most developed countries of the world (approximately 1/6 of the whole population). In addition, foodborne illnesses can have serious health aftereffects e.g. kidney failure or paralysis. The other basic problem is that the number of cases can be even higher, which lies in the fact that only a small fraction of foodborne disease cases get reported through official (or unofficial) reporting systems [15]. The essential basis of food safety is the minimum standard concretized e.g. by specific limits of biological or chemical contamination of foods. It is an authorized, official level; however, the question still remains: Will a food really be safe and in no way injurious to health just because the authority, at EU level the EFSA (European Food Safety Authority) provided a positive opinion? The EFSA (its Food Additives and Nutrient Sources Panel) for example in case of carrageenan (a food additive usually added to puddings for children for instance) noted uncertainties as regards the chemistry, the exposure assessment and biological and toxicological data. “Taking into account the lack of adequate data to address these uncertainties, the Panel concluded that the existing group acceptable daily intake (ADI) for carrageenan (E 407) of 75 mg/kg bw per day should be considered temporary, while the database should be improved within 5 years after publication (2018) of the opinion” [2]. There are uncertainties; we are in the state of the lack of adequate data but just go on with eating at least five years!

In a similar case the opinion of EFSA, adopted on 19 January 2005, concluded that GMO crop *Zea mays* L. line

1507 is “*unlikely to have an adverse effect*” on health or the environmental elements in case of its proposed use [19], thus it can be put on the shelves, therefore it can be available commercially to farmers. Although adverse effect is not excluded, but it is unlikely. Unlikeliness is not adequate when health and life is on balance. This is the biggest problem of the first, the authorized, official level of food safety.

The situation is just the same in the US where the growing of GM crops have been authorized as safe for the environment and human health. This authorization cannot be a guarantee, the authorities’ evaluation cannot be correct and sufficient and duly supported. Of course the EU food law system tries to be up-to-date¹ (the EU Food 2030 research strategy will also help future-proofing this food system), the Codex Alimentarius (Latin for “Food Code”) and the Codex Alimentarius Hungaricus is also an up-to-date collection of internationally recognized standards, guidelines and recommendations relating to food safety, but “scientific certainty” often seems to be a moving basis to lean on.

B. The Second Layer

The other layer of food safety is the absolute one which seems to be a “gourmand” or “classy” level of demands, the requirements of which are more sophisticated, strictly linked with the precautionary principle taking it seriously. It is largely related to a narrower range of disease-causing factors (dealing with no infectious organisms) and consequently aims to exclude other kinds of food borne diseases in comparison with the first level. The other difference is the time-factor associated with the certain disease. Illnesses can significantly be different, may vary by the length of time of emergence (the disease develops even over a number of years e.g. cancer). The root cause is that actually there is no threshold in case of chemicals, yield-enhancing materials and biocid products. It means that in fact there can be no credible and infallible statement that a certain amount of these materials is unexceptionally safe, definitely does not cause any health problems. This higher food safety level is based on the fact that the consumption of residue levels permitted by public authorities can also cause illnesses e.g. due to accumulation, mixing with other pollutants, chemicals or pesticide residues. The expression of “higher level” does not mean that it is more stringent, more desirable, rather it is usually linked with higher health consciousness and higher level of informedness or last but not least environmental consciousness. Basic food safety procedures, e.g. the operation of the rapid alert systems, try guarantee the basic (emergency) security. This second level is based on this, and goes beyond the basic requirements and is represented for example by agri-environmental protection and agri-environmental law. This food safety layer is optional, not legally binding, e.g. no farmer can be obliged to organic farming, nor can the consumption of organic products be prescribed (unless by an enlightened doctor). Within the

¹ Whilst – according to Ms. Smith DeWaal, the former Director of Food Safety at the Center for Science in the Public Interest (CSPI), Washington, D.C – “the United States food safety system is antiquated and failing”. [8, p. 921].

regulatory health limits, anybody can distribute or consume food containing residues of authorized pesticides and chemicals. *The responsibility of the consumer is personal, cannot be transferred to the state, to the farmer or to the food business.* Since today's man (especially woman, see the household and beauty care products) is exposed to so much complex chemical and other factors, it would be difficult to make credible statistics on how much does the consumption of a wide range of chemicals (even within the official limits that is otherwise declared as safe) increase the chances of chronic illnesses and premature deaths.

IV. THE CONCEPT OF FOOD SOVEREIGNTY

The main aim of European Community right from its establishment was being able to put food on the tables, reaching „*food security*”. *Actually this expression became the watchword of a globalized agrochemical and food processing industry and politics by the new millennium.*

“In the past few decades have witnessed an astounding concentration of the power of *transnational agri-food corporations along global food chains.* [...] Transnational corporations dominate three strategic segments of the world food economy – provision of inputs, trade in agricultural commodities and food processing, and food retailing – and impinge on production as well by promoting industrial monocultures” [14, p.381]. This “corporate food regime has promised cheap food coordinated by transnational corporate supply chains, legitimized with a food security—productivity—modernization narrative. Today food crises are putting into question its ability to feed the world and *its high environmental costs are becoming increasing evident*” [14, p. 383].

Several concepts have been employed in agriculture and food systems with *food security, right to food and food sovereignty.* Food security has become the central concept used also in most of international organizations such as FAO, World Bank and IMF [13, p. 3]. “Food sovereignty, *as a critical alternative to the concept of food security,* is broadly defined as the right of local peoples to control their own food systems, including markets, ecological resources, food cultures, and production modes” [24, p.87]. Food sovereignty aims to shorten the distance between consumers and producers and eliminate agriculture from World Trade Organization (WTO). It also seeks to restore the control over local resources and markets on small farmers and also stimulate local cooperatives and Community Supported Agriculture (CSA) [13, p.4].

It is obvious that the definition of food sovereignty needs a bit more precision. It must be more comprehensive according to which it implies all the rights of individuals, communities and countries to define their own agricultural, fishing, food, land and water management policies which are appropriate to their unique ecological, social, economic and cultural needs and abilities. It also contains the right to safe, nutritious food and to the ability to sustain themselves via producing food in an ecologically sustainable way (e.g. free from GMOs). It is also inevitable to be able to use and control all the life-

sustaining natural resources [18, p.45].

While often perceived as “antitrade,” the food sovereignty movement is actually engaged in deep, ongoing conversations about what kinds of trade relations will best serve the social, economic, political, and environmental principles of an alternative food paradigm [24, p.94]. It must be admitted that related to the development of Agricultural Law, also the process called „internationalization” of Agricultural Law („Internationalisierung”) by Norer [17, p.13-14] is in progress. This is signified in the context of the Comprehensive Economic and Trade Agreement (CETA) concluded between the EU and Canada, and the Transatlantic Trade and Investment Partnership (TTIP) to be concluded by the EU and the USA *dealing with the liberalization of the GM regimes.*

Food sovereignty is logically interconnected also with land concentration of course including also land grabbing² which has not any internationally recognised single definition. *Land grabbing is generally understood* to mean a process of acquisition of agricultural land without obtaining the consent of the local population and contrary to their interests. Ultimately, this process diminishes the ability of the local people to produce their own food. The usurping land acquirers also gain the right to use the natural resources (e.g. water supplies) and all the proceeds arising from their use [5].

A special kind of land grabbing can also be noticed in tight connection with GMOs, which is eroding food sovereignty. This phenomenon has a deforming effect in the relation of cultivation systems. It gradually takes lands away from non-GMO farming systems, in fact by depriving them from their non-GMO status. That is why it can be designated more precisely as “*land grabbing from non GMO farming systems*”.

V. GMOs AND OTHER FARMING SYSTEMS: COEXISTENCE AND THEN NON-EXISTENCE

There are several linking points between agriculture and nature, primarily because they share the same territories. Agriculture uses – in addition to non-living, inorganic natural elements like water – *also the living natural foundations of life,* the flora and the fauna.

In the case of GMOs, „*the role of precaution* has coincided with widespread public disquiet throughout Europe (but not so much in North or South America and Asia) over the introduction of *nonnatural genes into living organisms,* especially food crops” [20, p.10].

In the EU law, *precautionary principle* means that „in specific circumstances where, following an assessment of available information, the possibility of harmful effects on health is identified but scientific uncertainty persists, provisional risk management measures necessary to ensure the high level of health protection chosen in the Community may be adopted, pending further scientific information for a more comprehensive risk assessment” [21, Article 7].

Right after Hungary joined the European Union, the GMO

² In this context, the European Commission has published guidance on how to protect agricultural land (Interpretative Communication on the Acquisition of Farmland and EU law, 2017/C 350/05 of 18.10.2017).

question was raised also in the context of economics *in connection with the cultivation of GMO plants*. Answering to this demand, the Hungarian Parliament adopted its No. 53/2006 (XI.29.) decision with an overwhelming majority. In this decision it was considered that „*maintaining the GMO-free status of the country means an increasing competitive advantage*” on the markets and significantly improves our environmental and food security [22, p.169]. Moreover, *the Hungarian law states the general prohibition of using GMOs on the lands at the constitutional level*. It is unique, dealing with the question of GMOs in this level of legislation.

According to the Fundamental Law of Hungary (25 April 2011) Hungary promotes the effective application of the right to physical health by an agriculture free of GMOs, by ensuring access to healthy food and drinking water³, [...] as well as by ensuring the protection of the environment (Article XX). This article is in line with the precautious opinions about environmental and economic risks of GMOs.

The biggest agricultural problem of GMOs is the impossibility of a sustainable “coexistence”. It would be the ideal state where all farming systems exist and also let exist the other ones *permanently*. It seems to be impossible to live together without threatening each other’s operation and existence. When organic, conventional, and GM farming systems are standing alongside, they are inevitably effecting each other. Regardless of how conscientiously and responsibly farmers work to control their farms, pollen from GM farms can be drift immeasurable distance away via wind. The Sahara sand – in comparison – usually flies over Italy and Greece (this spring even also over Hungary) which means a thousands of kilometers long “ethereal” journey for the pieces of sand. Pollens are even smaller and can also fly without limits carrying the artificial genome as a pollution. That is why it always will remain a hopeless experiment, because of several biophysical reasons (mainly due to genetic drift by cross-pollination and crop scattering or mixing). Consequently, *the biggest problem with coexistence regulation is that it includes immanent damages for sure*. Bees and other pollinators, just like air movements, are reluctant to follow the rules of coexistence, so implementation is unthinkable without harms of interests. The result is sure: more intense contamination of non GM agricultural lands (crops), first within the technical threshold, then beyond: *the systems are „coexisting” for a while, and then the other two, the traditional and organic production sytem disappears. They become „non-existent” „from co-existent” due to genetic contamination*.

Despite of banning GMOs in cultivation, just to be in accordance with EU law Hungary had to make a special coexistence regulation. It states that *the responsibility for damage caused by GM cultivation shall be governed by the Code of Practice for Hazardous Activities laid down in the Civil Code, unless the injured party has given a written consent to the cultivation of genetically modified plants* [9, p.287].

³ Water is also ingested directly or indirectly just like other foods, thereby contributing to the overall exposure of a consumer to ingested substances.

The new EU regulation allows every member state to ban or to permit the production of GM crops in its territory. Consequently, it is a realistic scenario that Europe is going to look like a kind of chessboard (one GMO country – one non-GMO country and so on). This actually means that *we are witnessing a large-scale coexistence experiment*. The problem can be predicted: the black fields gradually pass through the white fields. The grey, blackened fields, however, can no longer be cleansed and can no longer be considered as white. The freedom of choice is not just damaged, but toally disappears in this case. Just see the example of the United States, where this process of genetic pollution has also taken place.

In the United States, the Supreme Court held that genetically engineered organisms were patentable subject matter from 1980. Companies such as Monsanto (now merging into Bayer), along with the courts, have made clear that it is the patent owner who maintains a property interest in any and all “genetic drift” (case Monsanto Co. v. Bowman, 2011). *In an other case the legal solution shows more sense of justice*, according to which „it is the patented genetic modification that created the inherent and foreseeable harm to organic farmers” and the patent owner – who takes the profit from selling the seeds – should be held liable” [23, p.171], not the organic farmers. If GM crops were also to be grown in Hungary, it would be a significant surplus cost to check and prove the purity of GMO-free products officially.

In the context of precaution, in 2013 a Kansas wheat farmer filed suit against Monsanto for GMO contamination. GMO wheat was found growing among crops intended to produced for commercial use. Lab results confirmed the wheat was in fact Monsanto’s product. Neither the US nor its trading partners had approved this GMO wheat for human consumption [23, p.180], obviously based on precautionary considerations. *We cannot be sure that the children or grandchildren (or any descendants) of GMO consumers will have no health problems*. However, “twenty years is no time at all on an ecological – let alone evolutionary – time scale. Without careful controlled and independent long-term study at organism and ecological scales (and it is hard to see that such study, at our current state of technology, could be safely undertaken at all), it is incorrect to claim the GMOs have in general been shown to be safe”. [20, p.12]. All the pursuits of agri-environmental protection share the responsible and protective aim of this precaution.

The co-existence approach is of course directly linked not just to farmers’ choice - but to consumers’ choice as well: to provide consumers with adequate information to let them make an informed choice between GMO, conventional or organic foods. ‘This right to information should not simply be meant as “traceability” and “labeling” system that should also function properly, but also as a duty of the agricultural sector that is responsible to feed people, that should provide the different types of foods. Otherwise, when people do not have several choices, they are unconsciously forced to buy whatever is presented to them at market’ [3].

In relation to GM products and the protection of human

health, the USA has confirmed the concept of the so called “substantial equivalence” as a legal prettiness: If a GM product is significantly the same as its conventional counterpart (unfortunately the most important question, the cell differentiation is forgotten during the examinations), it should be regulated the same as the conventional product. The alterations of the protein chains are not qualified as a significant difference so as to be able to easily market GM products.

In sum, *agro-genetic engineering – in spite of its spectacular results – is considered to be at the stage of its „stone age”, because its risks are not yet safely managed.* Nevertheless only one decade after the first „successful” experiments, GMOs have been launched into cultivation. In other areas of life it is clear: until it is ascertained without any doubt that it is harmless, we will not catch an electric wire (it is not enough if it is „unlikely” that is under alternate current). On this issue, however, *the efforts driven by financial interests to put off precautionary considerations are extremely strong.*

VI. AGRI-ENVIRONMENTAL LAW AS A WAY TO ENSURE FOOD SAFETY

As a result of the process called „greening” („Ökologisierung”) by Norer, an essential feature of agricultural law is the „ecological coloration” [16, p.15]. *That is why agri-environmental protection gains ground denying GMOs while strengthening food safety.*

Agri-environmental law forms a point of contact between agricultural law and environmental law. Its naming (agri-environmental law, Agrarumweltrecht, agroenvironnement) gives expression to its borderland nature. In addition it has deep embeddings in natural philosophy and sciences.

The important steps of agri-environmentally relevant legislation are aiming at the protection of natural values, the environmental media and *strengthening food safety, the quality of agricultural products intended for human consumption. These aims exclude the acceptance of GMOs in the agri-environmental production.*

“The definition of agri-environmental law can be formed with a teleological approach. *Those norms, and other legal devices, that are aiming at*

- the prevention or reduction of environmental risking, degradation or pollution (like GMO pollens) which can be ascribed to agricultural activities,
- the reduction or ceasing of damage of the environmental media, as well as
- the restoration of an antecedent state of the environmental elements just like before the activity entailing the mentioned negative effects (environmental in integrum restitutio)

belong to the concept of agri-environmental law”

[10].

While setting down the landmarks of agri-environmental protection the central question is the enumeration of the affected environmental elements, the consideration of the medial-, causal- and vital fields of environment protection that can be involved. The most important special fields belonging

to agri-environmental law – *according to the degree of the food safety relevance – are water protection, soil protection, finally the speciality dealing with the environmental risks of the genetic modifications of genetic engineering, the so-called agricultural or “green biotechnology” [10].*

The orders of agri-environmental law are meant to be the sensible balance, but do not compromise on GMO issues due to the precautionary principle that has been invoked to ensure health protection through the higher (absolute) level of food safety and the highest possible impurity of foods.

VII. CONCLUSION

Food security is about the question of quantity, while food safety is ensuring a kind of quality, reducing harmful ingredients to the smallest possible amount. Food from agri-environmentally sound systems (like organic food) without certain chemicals, or genetic engineering is free from safety gaps excluded by the second (absolute) level of food safety.

In the EU „the guiding principle is that food safety policy must be based on a comprehensive, integrated approach” and must be detailed enough addressing all challenges, even at the level of certain biological or chemical contaminants⁴. Nevertheless, the human desire to put nature in harness will not succeed in the XXIst century either. It is written in ancient China’s ‘holy book’, the I Ching, that ‘people can not change the well.’ It means that man is not able to transform the natural foundations of life. Life will always depend on the same basic conditions. The well from which we can draw water, includes the idea of an inexhaustible supply of donations [11, p.304], but it seems to have intangible limits. In the accelerating competition between nature and science, only the former can bear the palm, forcing us to admit some level of ignorance and uncertainty.

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⁴ See e.g. The Regulation (EU) 2015/1375 laying down specific rules on official controls for *Trichinella*.

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