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**Report Highlights:**

Hungary is one of the strongest opponents of agricultural biotechnology in the European Union. Maintaining the country's GE-free status is still a government priority. However, Hungary's scientific and agricultural organizations, breeding and research institutions are speaking out in support of non-transgenic genome editing. In the case of an enabling legislative environment in the EU, the country would be open to adopting innovative biotechnologies.

## Executive Summary

Hungary does not produce any genetically engineered (GE) crops, animals, or cloned livestock. The Government of Hungary (GOH) opposes the use of GE products in agriculture. Political parties in Hungary have historically held a firm anti-GE position.

Hungary's GE-free status is seen as a commercial and marketing advantage since EU member states are the primary destinations for Hungarian planting seed and grain exports. Still, the country has a structural shortage of animal protein feed and must import large quantities of soybean meal, of which about 90 percent is GE. Therefore, research programs, and regional cooperation initiatives and agreements are targeted to increase domestic non-GE soy production and the use of alternative protein crops to reduce the country's dependence on protein feed imports.

This being said, financial, scientific and agricultural organizations, plant breeding and research institutions are speaking out in support of precision breeding and the potential benefit of such technology for Hungary's agricultural economy. According to various factions, in line with studies on the EU status of new genomic techniques, the [EU's directive](#) on genetically modified organisms (GMOs) should be revised, potentially facilitating a path for the use of these new technologies. Both pro-biotech non-governmental organizations (NGOs) and anti-biotech conservationist groups have called for a new or amended/updated national act on biotechnology activities, including innovative biotechnologies.

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## **CHAPTER 1: PLANT BIOTECHNOLOGY**

### **PART A: PRODUCTION AND TRADE**

#### **a) PRODUCT DEVELOPMENT**

In Hungary, there are no GE plants under development, nor are there plans to commercialize such products in the near future. GOH maintains a ban on GE crop cultivation, specifically outlined in the Hungarian Constitution (called the Basic Law). As a result, institutes and universities conduct most of the agricultural biotechnology research in laboratory environments. For example, research at the [Agricultural Biotechnology Institute](#) focuses on plants' defense mechanisms and host-pathogen interactions, plant development processes, and crop metabolomics. Optimizing the use of the CRISPR-Cas9 system, a genome editing technique, particularly for barley, wheat, and potatoes is among the Institute's objectives.

The [Center for Agricultural Research](#) is also active in plant science research. Its basic aim is to use local germplasm combined with the newest scientific and technical innovations to develop new generic plant genotypes, and to improve stress-adaption and quality in coarse grains. The Research Center also sees great potential in innovative biotechnologies and the applications of the CRISPR-Cas9 system. The Center has made many public comments in support of such innovations.

The European Court of Justice's (ECJ) decision put innovative biotechnologies under the EU's restrictive biotech legislation. However, governmental sources expressed support for non-transgenic genome editing in case of an enabling legislative environment in the EU, anticipating its positive impact on addressing future challenges of agriculture, environmental and climate protection. Hungarian plant breeding and scientific institutions have echoed this support over the past five years.

#### b) COMMERCIAL PRODUCTION

No GE crops or GE seeds on the market are produced in Hungary. In response to [Directive \(EU\) 2015/412](#), which allows individual member states to ban GE cultivation, the Ministry of Agriculture expressed in 2015 that "it was an especially important strategic interest for Hungary, laid down in its Constitution, to ensure a GMO-free agriculture." Under this directive, Hungary demanded that all of its territory be shielded from pending applications to grow gene-altered crops in the bloc. Measures of the directive have been transposed into national law by the amendment of [Act No. XXVII of 1998 on Gene Technology Activity](#) (in Hungarian).

#### c) EXPORTS

There is no commercial production of GE crops in Hungary, and the country does not export GE products. For years, various factions (including GOH, as well as agricultural and business interests) saw the constitutional prohibition on biotechnology in agriculture and the country's stated GE-free status as a marketing advantage since EU member states are the primary destinations for Hungarian exports.

#### d) IMPORTS

Hungary's imports of biotech crops are controversial in terms of its asserted GE-free status. The country has a structural shortage of animal protein feed. The agricultural sector needs around 550,000 MT of soybean meal and full-fat soybean meal annually, of which only 20-25 percent derives from domestic sources. The other 75-80 percent, of which about 90 percent is GE, is imported as trans-shipped product from other EU countries, typically from Slovenia and Germany. This import dependence makes farmers and feed producers vulnerable to external market movements.

Considering the significant shortage of protein feed, the [National Agricultural Research and Innovation Center](#) (NARIC) and its [Research Institute of Agricultural Economics](#) are in strategic cooperation with the [Magyar Szója Nonprofit Kft](#) (the Hungarian Soy Non-profit Ltd; in Hungarian), and the [Hungarian Grain and Feed Association](#) (in Hungarian) to help in decreasing the sector's import dependence. The aim of these partnerships is to promote the cultivation of soybean and other protein crops within Hungary.

#### e) FOOD AID

Hungary is not a food aid recipient country, and its role as a supplier in international food aid programs is insignificant. Food aid consignments (e.g., processed and canned foods) are occasionally sent to ethnic Hungarian populations in Transylvania (Romania) and the Sub-Carpathian region of Ukraine. Those consignments do not involve any kind of GE food.

#### f) TRADE BARRIERS

One of the most sensitive issues in Hungarian agriculture is the maintenance of the country's GE-free status. GOH opposes the use of GE products in agriculture. In this respect, all parties in Hungary hold a strong anti-GE position.

### ***PART B: POLICY***

#### a) REGULATORY FRAMEWORK

In Hungary, the Ministry of Agriculture takes the lead on regulating GE crop cultivation, trade, and processing. The [National Food Chain Safety Office](#) (NFCSO) (in Hungarian) is the top government organization handling the technical aspects of GE products such as inspection, testing, and registering plant varieties. In 2006, Hungary developed its GE-free strategy ([Parliamentary Resolution No. 53/2006](#) – in Hungarian). [Act No. LIII of 1996 on nature conservation](#) was the first law in Hungary to include provisions on GE organisms.

Today, the main piece of biotech-related legislation is [Act No. XXVII of 1998 on Gene Technology Activity](#). The goal was to prevent the domestic production from unregulated entry of GE plant varieties and to give expanded powers to environmental, agricultural, and industrial biotechnology authorities. For direct consumption of imported food and feed containing GE materials, the act orders the use of legal and administrative procedures corresponding to the EU.

Hungary's legislation on GE crops, animals, and microbes as well as on their products is fully harmonized with the EU, transposing directives into national law. EU regulations pertaining to GE products are directly applied.

Below is an abbreviated list of those rules and regulations regarding biotechnology.

- [Decree No. 82/2003. \(VII. 16.\)](#) (in Hungarian) on rules of registration and reporting of gene technology activity, and on the documentation that must be enclosed in the notification (application for authorization) of such activity.
- [Joint Decree No. 111/2003. \(XI. 5.\)](#) (in Hungarian) on activities and procedures that must be considered as gene technology activity as well as on authorities that are entitled to control such activity.
- [Decree No. 128/2003. \(XII. 19.\)](#) (in Hungarian) on the organization and the activity of the Gene

Technology Advisory Committee.

- [Decree No. 48/2004. \(IV. 21.\)](#) (in Hungarian) on production and marketing of arable seeds.
- [Government Decree No. 132/2004. \(IV. 29.\)](#) (in Hungarian) on the authorization procedure of gene technology activity as well as on liaising with the European Commission in the course of that.
- [Decree No. 142/2004. \(IX. 30.\)](#) (in Hungarian) on certain rules of gene technology activity in the field of agriculture and industry.
- [Joint Decree No. 31 of 2006 \(IV. 29.\)](#) (in Hungarian) on imports and distribution of certain genetically modified feedstuffs.
- [Decree No. 86/2006. \(XII. 23.\)](#) (in Hungarian) on coexistence measures on the cultivation of genetically modified, conventional, and organic plants.
- [Decree 53/2013. \(VI. 17.\)](#) (in Hungarian) on safeguard clause procedure on seeds of inbred lines and hybrids of MON 810 corn.

As there are no uniform rules and regulations on labeling of GE-free food and feed within the EU, Hungary developed its own system. [Decree No. 61/2016 \(IX. 15\)](#) (in Hungarian) on labeling GE-free products entered into force on September 20, 2016.

#### b) APPROVALS / AUTHORIZATIONS

In Hungary, the cultivation of GE crops is constitutionally prohibited. There are no GE plants approved for production. Data on experimental releases authorized decades ago can be found on the [Hungarian Biosafety Website](#).

Regarding the import of food and feed with GE content, Hungary applies EU-harmonized legislation. Approval of GE products at EU levels falls under [Regulation \(EC\) No 1829/2003](#). The EU legislation gives responsibility for scientific risk assessments to the European Food Safety Authority (EFSA) in cooperation with the Member States' (MS) scientific bodies. After EFSA has reviewed the application to assess food safety and provided a scientific opinion, the European Commission and the Member States review and vote upon the application for market approval. A full list of approved GE products as well as products for which an authorization procedure is pending is available at: [https://webgate.ec.europa.eu/dyna/gm\\_register/index\\_en.cfm](https://webgate.ec.europa.eu/dyna/gm_register/index_en.cfm)

Although the Ministry of Agriculture formally makes approvals, the [Gene Technology Advisory Committee](#) (in Hungarian) evaluates biotech activities and products in Hungary. It provides professional opinions on applications submitted to gene technology authorities and makes recommendations on their acceptance or refusal. The [Hungarian Academy of Sciences](#) (HAS), the Ministry of Agriculture, the Ministry of Human Resources, and non-governmental organizations (NGOs) nominate the members of the Advisory Committee. Ministries typically nominate scientists or experts from think tanks.

#### c) STACKED EVENT or PYRAMIDED EVENT APPROVALS / AUTHORIZATIONS

Hungary follows EFSA's guidelines for stacked events. At the EU level, stacked events are subject the provisions of [EU Regulation No. 503/2013](#), Annex II.

#### d) FIELD TESTING

Field tests for GE crops have not been approved in Hungary since 2012, according to the [Hungarian Biosafety Homepage](#). Previous tests were conducted for scientific purposes only in corn, tobacco, potato, sugar beet, wheat, and barley. None of these crops were ever commercialized.

## e) INNOVATIVE BIOTECHNOLOGIES

Since 2004, Hungary has been one of the strongest opponents of agricultural biotechnology in the EU. However, Hungary's Ministry of Agriculture, financial, scientific and agricultural organizations, and plant breeding and research institutions have spoken in support of non-transgenic precision breeding.

It was an important milestone that the Hungarian Academy of Sciences published a [report](#) (in Hungarian) in 2017, concluding that genome-edited products should not be considered “GMOs” as defined – and prohibited – by the Hungarian Constitution. The Hungarian Academy of Sciences also stated that Hungary would stand to benefit from innovative biotechnologies as they become more widely used.

In 2018, Hungary's Agriculture Minister also outlined his opinion in support of genome editing, arguing that precision breeding without the introduction of foreign DNA must be supported and cannot be regarded as genetic modification. In line with his opinion, the Ministry of Agriculture and its ally organizations became more open to dialogues on agricultural innovation even in terms of non-transgenic technologies.

Hungary's National Chamber of Agriculture – an influential public institution – recognized the potential of precision breeding. It started a comprehensive consultation on it with NARIC. This included a panel of experts with biotechnologists, breeders, and representatives of green and organic farming organizations.

After the decision from ECJ, which included products from innovative biotechnologies under the EU's “GMO” legislation, the National Chamber of Agriculture and the Association of Hungarian Farmer Cooperatives and Societies issued a press release, including the following statement: “It is necessary to carry out the needed scientific research on and risk assessments of genome editing to eliminate any possible adverse effects on human health and the environment. With delays or neglect of these methods, we run the risk of isolating European and domestic agriculture from the benefits of innovative developments, as opposed to the rest of the world. In parallel, there is also a risk of losing research capacities that would allow us to join agricultural developments after the risk assessment of these technologies.”

Comments made by the Minister of Agriculture seemed to echo this belief. According to Minister István Nagy, although Hungary must accept the ECJ's judgement, the “GMO” legislation should be revised. Still, the official position from GOH on genome editing is not yet publicly available.

Since 2018, the Ministry of Agriculture has been in listening mode, unlike professional organizations and research institutions. The latter ones highlighted widely shared concerns about the ECJ's ruling, which equates products developed using targeted forms of mutagenesis with genetically modified organisms. Joining EU-wide initiatives, they called on the European Parliament and the European Commission to rethink the EU's stance on genome editing of crop plants to enable Europe to compete in sustainable food production and keep up with the speeding pace of innovation in agriculture. These institutions wanted to reverse the ECJ's ruling on innovative biotechnologies. Hungary's Biological Research Center highlighted the need for new EU legislation to enable farmers to use new technologies and to produce higher yields while decreasing the use of chemicals and water.



#### f) COEXISTENCE

The Government approved its Coexistence Regulation in November 2006 (see the “Biotech update 2006”; report [HU6015](#)) by the amendment of [Act No. XXVII of 1998 on Gene Technology Activity](#) (Chapter III). This act, as well as [Decree No. 82/2003](#) (in Hungarian) and [Decree No. 86/2006](#) (in Hungarian), outline the rules for coexistence of organic, conventional, and GE crops. These rules determine all the conditions that are designed to prevent the uncontrolled spread of GE crops and their mixing with non-GE products, and to include buffer distances, cleaning of machinery, and separate storage.

#### g) LABELING AND TRACEABILITY

Hungary follows the EU’s labeling standards. If GE content is above 0.9 percent per ingredient, it must be indicated on the item’s label. Meat and other animal products derived from animals fed on GE feed do not require a distinctive label.

Since there are no uniform rules and regulations on labeling of GE-free food and feed in the EU, Hungary developed its own labeling system (for the specific legislation, see Part B - Regulatory Framework). This legislation provides special labeling of GE-free food and feed, and processed products as well as labeling of GE-free honey, meat, fish, eggs, and milk from livestock fed on certified GE-free feed. The application of the “GMO-free” labeling is voluntary.

For a product to be labeled “GMO-free,” it must not contain any GE organisms or derive from livestock fed on GE material. Labeling claims must be verified by the producers. Producers and traders of food labeled as being GE-free are obliged to ensure the traceability of the products including raw materials. According to the national law, food products of plant origin can still be labeled as “GMO-free” in case of minute GE content (i.e., traces of GE material up to 0.1 percent) if the content is adventitious or technically unavoidable. However, animal feed can be used in GE-free meat, fish, milk, and egg production if it is not required to be labeled due to its GE ingredient content under [Regulation \(EC\) No. 1829/2003](#). This means that the permitted GE content in “GMO-free” feed is 0.9 percent.

The “GMO-free” label cannot give the impression to customers that the product has special sensory and nutritional features, and its effect on environment and health is better than similar products. In addition, products that have no licensed GE version on the market cannot be labeled as “GMO-free.”



Certifying mark for labeled products derived from GE-free production

#### h) MONITORING AND TESTING

Since Hungary is a major seed exporter, genetic purity of seeds is highly important to producers. Plant propagation materials (including seeds) go through sampling and laboratory analysis for the presence of GE traits. Official controls apply to Hungarian crops and seeds from other EU member



states and non-EU countries. Under the rules, third country seed imports are subject to mandated testing for GE presence, paid for by importers or distributors. Imported seeds from EU member states must be accompanied by a negative GE test from an EU accredited laboratory. Farmers can only use seeds that have been certified as GE-free.

Corn, rapeseed, soybean, rice, flaxseed, potato, pepper, sweet potato, wheat, and avocado products were the targets of GE testing efforts over the past years. However, petunia and dianthus plants were also tested for GE traits. In 2021, the NFCSO's tests showed the presence of GE traits in soybean sown on 400 hectares despite the constitutional ban on GE crop production. All the unapproved plants were destroyed before harvest.

#### i) LOW LEVEL PRESENCE (LLP) POLICY

Hungary applies a zero-tolerance policy for LLP of GE products in feed, following the measures of [Commission Regulation \(EU\) No. 619/2011](#). It lays down the methods of sampling and analysis for the official control of feed as regards presence of GE materials. The EU defined “zero” with a “technical solution” level of 0.1 percent.

#### j) ADDITIONAL REGULATORY REQUIREMENTS: none

#### k) INTELLECTUAL PROPERTY RIGHTS (IPR)

In Hungary, there is no specialized intellectual property legislation for GE products. Genetically engineered crops cannot be planted commercially. In general terms, the country is against patents on genetic materials. Application for national plant variety protection can be filed with the [Hungarian Intellectual Property Office](#), while the application for EU plant variety protection can be submitted directly to the [Community Plant Variety Office](#).

Hungary is an active participant of negotiations under the [International Union for the Protection of New Varieties of Plants](#) and the International Convention for the Protection of New Varieties of Plants.

#### l) CARTAGENA PROTOCOL RATIFICATION

The Hungarian Parliament ratified the Protocol on January 13, 2004. [Government Decree No. 226/2008 \(IX.11\)](#) (in Hungarian) laid down the rules of the implementation. The publication of the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety was by [Act No. CLXXI of 2013](#) (in Hungarian).

With respect to the Convention on Biological Diversity (see [the sixth national report](#)), Hungary created a [National Strategy for the Conservation of Biodiversity in 2015-2020](#) (NSCB). Following the objectives highlighted in the former NSCB, the elaboration of a new strategy has already started. To comply with the Aichi Targets, NSCB suggested several actions to eliminate harmful effects on biological diversity, for example:

- “Introduction of safeguard clause procedures and/or urgency measures for “GMOs” that are permitted for production in the EU and have harmful effects.
- Preparing a study of social, economic, and environmental reasons for banning the production of GMOs in general, a group of GMOs, or individual GMOs on a case-by-case basis (such as preserving environmental and landscape characteristics, habitats and ecosystems, and specific ecosystem functions and services).

- Active monitoring and testing of GMO contamination in plough-land located close to Hungary's borders.
- Contacting neighboring countries and concluding diplomatic treaties with them in order to keep the areas close to Hungary's borders GMO-free.
- Active monitoring of gene technology-related activities.
- Providing technical requirements and funding for environmental and health impact studies in Hungary, concerning GMOs' undergoing authorization procedure in the EU."

#### m) INTERNATIONAL TREATIES AND FORUMS

Hungary is an active member of different intergovernmental and standard setting international organizations (e.g., Organization for Economic Co-operation and Development; World Trade Organization; Codex Alimentarius; Food and Agriculture Organization of the United Nations - International Plant Protection Convention; etc.). Despite the relatively small market size of the country, Hungary can leverage its regional influence as a member of these organizations, especially through the EU representation and regional alliances such as the [Visegrád Group](#) (V4).

Hungary took over the annual Presidency of the Visegrád Group on July 1, 2021. In many aspects, its [V4 presidency program](#) are in line with the [objectives of the Slovenian EU Presidency](#). For instance, in the face of unprecedented challenges such as COVID-19, animal diseases, and climate change, both of the programs make a shift towards treating agriculture as a critical and strategic sector that must provide a secure, adequate, sustainable, and resilient food supply. The Hungarian V4 Presidency is committed to conducting constructive, high-level dialogue with the EU Presidency and with the Central and Eastern European and Baltic countries on the reform of Common Agricultural Policy (CAP) to achieve the sustainability goals. Hungary aims to coordinate the V4 positions and identify common interests related to the [EU's new Circular Economy Action Plan](#), the European Green Deal, and other relevant documents and regulations in order to reach climate-neutral, resource-efficient and circular economy. Therefore, Hungary also joined the [Agriculture Innovation Mission for Climate](#) (AIM4C) in 2021, which is a joint initiative by the United States and the United Arab Emirates, being in line with the United Nations' Sustainable Development Goals. Based on it, innovation and innovative technologies are expected to play an important role in the country's future policies.

#### n) RELATED ISSUES

According to 15 Member States, mostly Eastern and Central European countries, developing and increasing the EU's plant protein production could be a way of effectively addressing food security, environmental, and climate challenges that European agriculture is facing. In this regard, Hungary raised its voice at the [Agriculture and Fisheries Council](#) meetings in favor of the EU's GE-free production and the [European Soy Declaration](#). It was a joint proposal by Hungary and Germany, which was accepted and officially signed by the agriculture ministers of 14 EU member states in 2017, underlining its potential role in boosting Europe's GE-free soybean production. "GMO-free crops that meet European standards could contribute to environmental and climate goals," Hungary's Minister of Agriculture outlined on September 21, 2020, at the Council's meeting.

The country is a member of the [Donau Soja \(Danube Soy\) Organization](#). Since Hungary is only 20-25 percent self-sufficient in soybean meal, its participation in the Donau Soja program stimulates the region's non-GE soybean production and aims to reduce the large-scale dependence on imports.

## ***PART C: MARKETING***

### **a) PUBLIC / PRIVATE OPINIONS**

Hungarian consumers' careful attitude to GE products has been under pressure from anti-technology campaigns for years. The press often publishes negative opinions about GE ingredients in food and feed. At the same time, the number of pro-biotech publications and outreach activities is increasing. Consumers' choices and attitudes are mostly influenced by price sensitivity, their awareness of new technologies and products, and the availability of substitute goods.

### **b) MARKET ACCEPTANCE / STUDIES**

While several surveys point to the increasing health awareness of domestic buyers, other studies have shown that price continues to be one of the most decisive criteria for consumers in Hungary. In this regard, it is worth noting that the replacement of GE soybean meal in animal feed rations with conventional would result in higher food prices as there is no real or available protein feed alternative at present, according to market analysts.

## ***CHAPTER 2: ANIMAL BIOTECHNOLOGY***

## ***PART D: PRODUCTION AND TRADE***

### **a) PRODUCT DEVELOPMENT**

In Hungary, there is no commercial use of GE animals and clones for agriculture. Biotechnology for genetic improvement is mainly related to livestock breeding. The [Agricultural Biotechnology Institute](#) of NARIC is the most active agricultural research facility in animal biotechnology. NARIC focuses on exploring the genetics of bovine diseases and works on the adaptation and development of genome editing tools for precision breeding. They are also involved in the functional characterization of pluripotent stem cells and working on models for biotechnology applications.

### **b) COMMERCIAL PRODUCTION**

Hungary does not produce any livestock clones, offspring of clones, GE animals, or products derived from animal biotechnologies.

### **c) EXPORTS**

Hungary does not export GE animals, livestock clones, or products from these animals including genetics.

### **d) IMPORTS**

Currently, no legislation regulates the import of semen or embryos from clones. Despite this fact, livestock clones or genetics from these animals are not likely imported into Hungary. This is because increasingly better and improved traits, and top-quality genetics from new sires are available on the market year by year, according to the local distributors of bovine genetics. There are no imports of GE animals.

### **e) TRADE BARRIERS**

See Part A f).

## ***PART E: POLICY***

### **a) REGULATORY FRAMEWORK**

Genetic engineering, including animal biotechnology, is regulated by [Act No. XXVII of 1998 on Gene Technology Activity](#). The Ministry of Agriculture takes the lead and makes decisions regulating biotech issues. The NFCSO is the top government organization that handles technical aspects such as inspection and testing. The administrative body, that receives and evaluates GE applications for biotechnology experiments, is the [Gene Technology Advisory Committee](#) (in Hungarian).

Hungary has no country-level legislation related to the commercial use and trade of clones, their offspring, or products derived from these animals. GOH supports the EU's efforts to create common EU legislation and institutions governing animal cloning. Hungary is still a vocal opponent of any kind of GE plant or GE animal products.

### **b) APPROVALS / AUTHORIZATIONS**

In Hungary, there are no GE animals approved or registered for use.

### **c) INNOVATIVE BIOTECHNOLOGIES**

In Hungary, breeding and scientific institutions see the necessity and the potential of innovative biotechnologies [see Part B e)].

### **d) LABELING AND TRACEABILITY**

Hungary does not produce or trade in any livestock clones, GE animals and their offspring or products. Although laboratory animals are used in animal biotechnology experiments, they are not released. Therefore, there is no policy for labeling and traceability related to livestock clones and GE animals.

### **e) ADDITIONAL REGULATORY REQUIREMENTS: none**

### **f) INTELLECTUAL PROPERTY RIGHTS**

There is no specialized intellectual property legislation for animal GE products. Applications for animal patents can be filed with the [Hungarian Intellectual Property Office](#).

### **g) INTERNATIONAL TREATIES AND FORUMS**

Hungary actively participates in the work of several multilateral and intergovernmental organizations such as the Food and Agriculture Organization of the United Nations, the World Organization for Animal Health and Codex Alimentarius related to animal health and food safety issues. In general terms, the country is against GE animals, but there is no specified position on animal biotechnologies.

### **h) RELATED ISSUES: none**

## ***PART F: MARKETING***

### **a) PUBLIC / PRIVATE OPINIONS**

The Hungarian public is quite critical of products coming from advanced production technologies. Animal cloning and food products made from cloned animals trigger concerns and are unpopular. Hungarian consumers are skeptical of the necessity and usefulness of food made from cloned or GE animals. At the same time, public opinion is quite positive about animal biotechnology used for medical purposes.

#### **b) MARKET ACCEPTANCE / STUDIES**

Public views on animal products connected with cloning and genetic engineering are expected to be similar to those held for GE crops. These products are likely to be rejected by most of the food retail chains in Hungary.

Although several biotechnology companies, university knowledge centers, and bio-incubators deal with research on animal biotechnology in Hungary, market surveys on the sale and use of GE animals and clones are not available. Biotech companies could gain ground mainly on the market of veterinary molecular diagnostics and marker-assisted selection.

### ***CHAPTER 3: MICROBIAL BIOTECHNOLOGY***

#### ***PART G: PRODUCTION AND TRADE***

##### **a) COMMERCIAL PRODUCTION**

Hungary's food and grain processing industry uses recombinant microorganisms and their enzymes for ethanol, isosugar, cheese, and lactose-free production as well as for starch processing.

##### **b) EXPORTS**

Although Hungary does not export GE microbes, exported alcoholic beverages, dairy, and other processed products may contain microbial biotech-derived food ingredients.

##### **c) IMPORTS**

Hungary imports recombinant microbes and microbial biotech-derived food ingredients, such as chymozin, lactase, and riboflavin. Trade data are not available.

Likewise, imported alcoholic beverages, dairy, and processed food products may contain microbial biotech-derived food ingredients.

##### **d) TRADE BARRIERS**

See Part A f).

#### ***PART H: POLICY***

##### **a) REGULATORY FRAMEWORK**

Hungary's legislation on GE microbes is fully harmonized with the EU, transposing directives into national law. EU regulations pertaining to GE products are directly applied (See Part B a).

[Regulation \(EC\) No 1331/2008](#), which establishes a common authorization procedure for food additives, food enzymes, and food flavorings, and [Regulation \(EU\) 2015/2283](#) on novel foods, are exclusive from the EU's GE food and feed regulation ([Regulation /EC/ No 1829/2003](#)). Thus,

approved food enzymes and novel food produced with GE microorganisms are not considered GE products.

#### b) APPROVALS / AUTHORIZATIONS

For approvals and the authorization of GE microorganisms and their products intended for food, Hungary applies EU-harmonized legislation, which is based on the EFSA's risk assessment.

Independently of whether food additives, enzymes, and flavorings are products of GE origin or not, the list of authorized substances can be found in the Annex of [Commission Regulation \(EU\) No 1130/2011](#).

#### c) LABELING AND TRACEABILITY

Food ingredients produced with GE microbes do not require labeling as GE products. Still, food substances derived from or produced from GE microorganisms, containing detectable genetic material, must be labeled as GE materials (for more information, see Part B g).

#### d) MONITORING AND TESTING

The NFCSO's annual monitoring activity to identify the presence of ingredients derived from GE organisms does not test for microbial GE content in food.

#### e) ADDITIONAL REGULATORY REQUIREMENTS: none

#### f) INTELLECTUAL PROPERTY RIGHTS

There is no specialized intellectual property legislation for microbial GE products. Applications for patents can be filed with the [Hungarian Intellectual Property Office](#).

#### g) RELATED ISSUES: none

### ***PART I: MARKETING***

#### a) PUBLIC / PRIVATE OPINIONS

Although the public is quite critical of new biotech achievements in the food industry, public awareness on microbial biotechnology is very low. Consumers' approach is skeptical regarding its usefulness and necessity. By contrast, research institutes raised their voice in favor of genome editing in microbial biotechnology as well.

#### b) MARKET ACCEPTANCE / STUDIES

Most products produced from microbial biotech-derived food ingredients no longer contain any evidence of genetic engineering. Therefore, microbial biotechnology and its public acceptance are not a focus of discussion and market studies.

#### **Attachments:**

No Attachments