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Prepared By: FAS-Turkiye

Approved By: Michael Francom

Report Highlights:

Türkiye's Biosafety Law continues to threaten imports and imposes a heavy financial burden on the country's agri-food sector. The number of approved of genetically engineered (GE) events remains arbitrarily fixed at 36 and only includes traits in corn and soy for feed use. There are no approvals for food use due to public sensitivities about the technology. These same sensitivities make it difficult for Turkiye to make meaningful revisions to the Biosafety Law. There are also 11 enzymes produced from GE Aspergillus oryzae that are currently approved for feed and industrial use, and one microbial mass (strengthened and inactivated GE Aspergillus oryzae) approved for feed use.

EXECUTIVE SUMMARY:

Since coming into effect in 2010, Türkiye's overly restrictive Biosafety Law and its implementing regulations have discouraged Turkish scientists from aggressively pursuing biotechnology research, forbid the commercialization of the technology, and negatively impacted the economy. Domestic politics and perceived public concerns are the main reasons for Türkiye's longstanding, rigid stance against the technology.

The Biosafety Law has interrupted imports, created lasting uncertainty in the marketplace, and unnecessarily increased costs for both Turkish producers and consumers. In 2019-20, imports of U.S. soybeans completely stopped because Türkiye hadn't approved new soybean events that were being grown in the United States. Not being able to buy U.S. soybeans negatively impacted the Turkish animal feed sector. While imports of U.S. soybeans has since resumed, the threat of a significant trade disruption remains because of a possible delay in MinAF's approval process and because of the prohibition on trace amounts of unapproved events in feed. According to one independent economic study, the cost burden of Türkiye's "GMO regulations" on the country's agri-food sector was $1.5-2.0 billion from 2009-2020.

Under the Biosafety Law, the Ministry of Agriculture and Forestry (MinAF) is the competent authority for reviewing and authorizing new genetically engineered (GE) events for plants, animals, and microorganisms. MinAF has set an arbitrary cap of 36 approved GE corn and soybean events for import which are only allowed for use in animal feed. The commercial production of GE plants (and animals) is strictly prohibited.

In 2024, MinAF renewed seven corn events that were set to expire. There are currently 13 pending GE plant events, some of which have been pending approval since 2015. In addition to plant products, MinAF, has approved 11 enzymes and one inactivated microbial mass made from GE *Aspergillus oryzae* for different industrial uses.

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ABBREVIATIONS:

Besd-Bir: Turkish Poultry Meat Procedures and Breeders Association
CPB: Cartagena Protocol on Biosafety
EU: European Union
EPPO: European and Mediterranean Plant Protection Organization
FAS: Foreign Agricultural Service of the United States Department of Agriculture
FAO: Food and Agriculture Organization of the United Nations
GE: Genetically Engineered
IPPC: International Plant Protection Convention
LLP: Low Level Presence
MinAF: Ministry of Agriculture and Forestry of the Turkish Republic
NGO: Non-governmental Organization
OECD: Organization for Economic Co-operation and Development
OIE: World Organization for Animal Health
TAGEM: Agricultural Research and Policies General Directorate of Ministry of Agriculture and Forestry

CHAPTER 1: PLANT BIOTECHNOLOGY

PART A: PRODUCTION AND TRADE

a) RESEARCH AND PRODUCT DEVELOPMENT

Article 5(1)(c) of the Biosafety Law bans the cultivation and production of GE plants and animals. This prohibition prevents the private and public sector from pursuing the commercial development of GE plant products. However, the law permits the regulated study and development of plant biotechnology for research purposes only. This research is very limited, according to academics, because of strict requirements and concerns over liability.

According to the Law and its implementing regulations, an application or permit is not required for agricultural biotechnology research, but the researcher must inform MinAF's Agricultural Research and Policies General Directorate (TAGEM) of the project within three months of its completion. Researchers must apply to TAGEM for a permit to import GE material and derived products for the purpose of research, development, training or educational activities. TAGEM is required to make a decision to authorize the permit within 15-days.

Since MinAF has not yet established rules for conducting field trials, research activities must remain in the laboratory. Despite these restrictions, in the last few years, Türkiye's Scientific and Technological Research Council has increased the amount of grant money for biotech research projects. Universities are also teaching biotechnology courses and doing some limited research in this field.

GE plants are prohibited from being cultivated in Türkiye and are, therefore, not used in producing antibiotics or pharmaceuticals for human or animal disease.

b) COMMERCIAL PRODUCTION

Article 5(1) (c) of the Biosafety Law bans the cultivation and production of GE plants and animals. Therefore, there is no commercial production of GE crops in Türkiye.

c) EXPORTS

Türkiye does not export GE crops to the United States or other countries, aside from GE grain transshipments that originate in third countries.

d) IMPORTS

According to the Biosafety Law, Türkiye has the authority to separately approve events for feed, food, and industrial products. As of September 2024, there were 21 corn and 15 soybean events approved for feed use. No GE events have been approved for food use, so any GE presence found in food is illegal.

Over the years, commodity traders have encountered problems importing GE commodities for use in feed due to Türkiye's asynchronous approval process. Non-DNA-containing products derived from GE plant sources, like corn oil from GE corn, are subjected to the rules of Biosafety Law and are not allowed to be imported unless the event has first been approved for food use. For imports of refined oils and other highly processed or non-DNA-containing products like sugar, sucrose, dextrin, invert sugar syrup, glycose syrup/powder, maltodextrin, fermented organic acids and fermented alcoholic beverages, the manufacturer or exporter must provide a declaration stating, "the product in question is produced from a non-GE source".

The trade of non-biotech products, such as wheat and rice, have also been negatively affected by the Biosafety Law. Shipments of these commodities have been rejected in the past because of the low-level presence (LLP) of GE content, such as dust from GE corn or soy. These rejections and changing market conditions have largely deterred U.S. companies from shipping these commodities to Türkiye.

Some importing companies that were found to have violated the Biosafety Law have been prosecuted under the charge of "biological terror" and been accused of causing harm to Türkiye's agricultural sector. With the intention of reducing the instances of prosecution for LLP in imports, MinAF amended the implementing regulation of the Biosafety Law to define the term "contamination" in the Regulation in May 2014. According to some sources, this change appears to have had some impact in reducing overly harsh penalties, such as imprisonment. Domestic poultry and livestock producers using imported feed products are still suffering from the financial burden of ongoing court cases and the GE traceability burden (see Part B, section (g)).

The testing of imported products for the presence of GE remains inconsistent and continues to be a considerable cost for importers. The unpredictable situation has increased costs and contributes to increased public suspicion of GE products.

Due to insufficient domestic production and increasing demand, Türkiye imports approximately half of the ingredients used to manufacture compound feed. Previously, the United States was among the top suppliers of soybeans to the Turkish market, but imports were greatly affected by the limited number of approved GE events and MinAF's testing measures (see Part B). Trade has been impacted because of concern about LLP of GE soybean traits in feed and food products could potentially result in rejected shipments.

The concern of LLP detection caused importers to avoid buying soybeans from the United States starting in 2018. By 2020, imports of U.S. soybeans were reduced to almost zero. Despite paying higher prices for feed materials, Turkish importers looked to other international sources for soybeans and derivative products. At the beginning of 2021, after MinAF approved six new GE soybean events, Turkish importers started buying U.S. soybeans again. Meanwhile, there are still concerns that imports of U.S. soybeans and other GE commodities from the United States could be interrupted if approvals are delayed.

Please see Part B of this chapter for detailed information about the approvals.

Importation of GE seeds is also forbidden by the Biosafety Law and by the seed circular.

e) FOOD AID

Türkiye is not a food aid recipient country. As no GE products are approved for food use in Türkiye, and Türkiye is not a producer of GE products, food assistance products procured in Türkiye would not be GE. Transit of GE products for food aid is allowed after MinAF's approval, checks, and monitoring.

f) TRADE BARRIERS

- Türkiye has approved significantly fewer GE traits than the European Union. Currently, the government maintains an arbitrary cap on the total number of approved events at 36.

- Türkiye's approval process is slower than approval systems in many countries.

- Türkiye has a zero tolerance for the detection of unapproved GE traits. A 0.1 percent tolerance for GE traits is allowed for events pending approval.

- The frequency sampling and testing imported commodities depends on the foreign competent authority's declaration whether the cargo in question does or does not include GE. Countries that regulate and declare GE products are subject to stringent testing whereas countries that do not declare GE shipments are not subject to the same controls.

- The Biosafety Law contains liability, sanction, and penalty clauses that penalize noncompliance with large fines and five to twelve years in prison.

PART B: POLICY

a) REGULATORY FRAMEWORK

Türkiye's regulation of agricultural biotechnology is governed by the Biosafety Law (Law No: 5977), implemented on September 26, 2010. On August 13, 2010, MinAF published two implementing regulations the Regulation on "Genetically Modified Organisms" & Products and the Regulation on the Working Principles of the Biosafety Board and the Committees.

Following the adoption of the Biosafety Law, MinAF established a Biosafety Board to review GE food and feed import applications and nominated its Agricultural Research and Policies General Directorate (TAGEM) as the secretariat of the board. The board had nine members who were high level MinAF bureaucrats and other subject matter experts from other relevant ministries. The board established two committees, the Scientific Risk Assessment Committee, and the Socio-Economic Assessment Committee to evaluate each application and make a recommendation to the board for approval. These committees were made up of experts from the scientific community, such as academia and public research institutes. The independent Biosafety Board reviewed and, where appropriate, approved the committees' recommendations for final approval.

However, the Biosafety Board was abolished by the Decree Law No: 703 which was published in the Official Gazette on July 9, 2018. Shortly thereafter, MinAF was authorized to conduct the tasks and responsibilities of the abolished Biosafety Board via a Presidential Circular published in the Official Gazette on August 1, 2018. MinAF subsequently re-appointed TAGEM as the secretariat of the committees and TAGEM re-established the Scientific Risk Assessment and Socio-Economic Committees to review pending and any new dossiers.

After receiving both committees' evaluations, the Minister of MinAF has the exclusive decision-making authority to approve the event in question, and that decision is published in the Official Gazette. For more information about the approved events for feed, please see Part B, section (b) of this Chapter on Approvals and for information about the approved enzymes refer to Chapter 3 of this report on Microbial Biotechnology.

Following the 2018 presidential election, nine Presidential Policy Councils were established. One of these councils is entitled the "Council of Health and Food Policies," was assigned the tasks of

developing policies, strategies, and monitoring the implementation of biotechnology. The Council has eight members, two of which are food or agriculture related members, and the remainder are health and medical professionals, such as doctors and dentists. The role of the Council in the regulatory approval process is unclear.

Legal Terminology used in the Biosafety Law and Regulations

Legal Term (in Turkish)	**Legal Term (in English)**	**Laws and Regulations where term is used**	**Legal Definition (in English)**
Modern Biyoteknoloji	Modern Biotechnology	Biosafety Law Regulation on the Working Principles of the Biosafety Board and the Committees	The application of in vitro nucleic acid techniques enabling direct transfer of rDNA and nucleic acid into cells or organelles, or fusion of cells between different species and classes outside the taxonomic family, that overcome natural physiological reproductive barriers beyond the techniques of conventional breeding and selection.
"Genetik Yapisi Degistirilmis Organizma (GDO)"	"Genetically Modified Organism (GMO)"	Biosafety Law Regulation on the Working Principles of the Biosafety Board and the Committees Regulation on "Genetically Modified Organisms (GMO)" and Products	Any living organism - excluding humans - including plant, animal and microorganism – obtained through gene transfer by modern biotechnological methods.

Application process and timeline

According to the Biosafety Law, developers of GE seed or importers of GE crops are allowed to submit applications for the approval of a GE event. Within 90 days of receiving an application, TAGEM decides whether or not to accept or reject the application, and for accepted applications, TAGEM determines the type of evaluation procedure, either simplified or regular. Within 15-days of making its decision, TAGEM informs the applicant whether the application is accepted or not.

In order to apply under the *simplified* procedure, per the rules set by MinAF, the following conditions should be met:

- Taxonomy and biology of the gene source and the receptor live organism should be known.
- Sufficient information should be available regarding the possible effects on human, animal, environmental health, and biological diversity.
- Previous risk assessments that can be used regarding the relations of the GE event with other live organisms should not have indicated any negative effects.
- Detailed methods and data should be available to enable the definition of the transferred genetic material and its identification within the live organism where it is transferred.
- The GE product should be approved in the country where it is developed or registered for release into the environment and placed on the market for consumption. (Article 3 (8) of the Biosafety Law)
- Authorization of GE product should not be expired in the country where it is developed.
- The results from the previous risk assessments as well as socioeconomic and ethical evaluations should be provided where available.

The TAGEM committees, in principle, are supposed to complete the reviews within 270 days. However, the 270-day clock stops when additional information or documents are requested from the applicant. In practice, the approval time for an application can take much longer than 270 days. Based on the Committees' assessments, the Minister of MinAF decides whether or not to approve the event in question. Türkiye requires an approval in the country of production before an application can be submitted in Türkiye, which makes asynchronous approvals unavoidable.

Unlike the regular procedure, decisions made using the simplified procedure are not published in the Biosafety Information Exchange Mechanism of Türkiye, the web platform in the Turkish language for public opinion and information exchange, decreasing the time required for a decision.

In the past, MinAF had requested that international developers to submit applications as quickly as possible after the application has been approved in the country of origin in order to avoid trade problems. However, companies have expressed concerns about the vagueness of the application procedures, as well as the severe yet unclear liability provisions in the Biosafety Law. The liability provisions of the law include harsh penalties that may involve lengthy jail terms for unspecified "related parties." The law also lacks explicit guidance about what documents are required and how the applications will be evaluated. Furthermore, it contains onerous labeling and traceability requirements once the product arrives in Türkiye.

Given the penalties and lack of clarity in the Biosafety Law, Turkish agricultural industry associations have instead submitted the dossiers and paid the application fees so they could import the feed materials needed for the sector. After a 10-year period of sector associations serving as applicants, a private feed

company made an application for a GE soybean event in 2020 for the first time and received approval in 2021.

Updates to Regulations

The last noteworthy update to the Biosafety Law and its implementing regulations happened in May 2014. At that time, with the intention of reducing the instances of prosecution for LLP in imports, MinAF amended the implementing regulation of the Biosafety Law. The amendment defined the term "contamination" as used in the Biosafety Law and established a 0.9 percent threshold over which products are considered "contaminated." However, the amendment does not clearly explain how "contamination" changes the ability to market products or commodities with GE events that are unapproved in Türkiye. For detailed information, please see GAIN report "Turkey Amends Biotechnology Regulation" Please also refer to Part B (i) regarding Türkiye's LLP policy.

LLP is considered, globally, to be a compliance issue and not a food safety issue, and so defining LLP detections above 0.9 percent as a "contamination" is not in step with international standards like Codex Alimentarius.

b) APPROVALS/AUTHORIZATIONS

Either the gene-owning technology companies or importers of GE crops may apply for approval of a GE event. Applicants are required to provide a dossier containing technical information and data on the event to be approved and pay an application fee. The application fee for the year 2024 is 128,000 Turkish Lira (TL) ($ 3,737 where $1 =34.3 TL) per event and the extension fee per previously approved event is 63,000 TL ($ 1,839 where $1=34.3 TL). To date, no technology-owning companies have submitted an application to be reviewed by the Biosafety Board or MinAF. Instead, Turkish agriculture industry associations and one private feed production company have made the applications.

Under the Turkish Biosafety Law, approval for biotech events automatically expires after ten years and a new application must be made to renew the events. Applicants seeking to renew an approval must file for an extension at least one year prior to expiration.

Please see the current list of approved events in below Table 1 and pending applications in Table 2. Approvals are officially announced by the Turkish Government in the Official Gazette in Turkish.

Table 1: Approved Events for Feed

No	Product	Developer	Event	OECD Unique Identifier	Approval Date
1	Corn	Syngenta	MIR604	SYN-IR6Ø4-5	7/16/2015
2	Corn	Monsanto	MON863	MON-ØØ863-5	7/16/2015
3	Corn	Bayer CropScience	T25	ACS-ZMØØ3-2	7/16/2015
4	Corn	Syngenta		SYN-BTØ11-1x	11/5/2015

			Bt11xMIR604	SYN-IR6Ø4-5	
5	Corn	Syngenta	MIR162	SYN-IR162-4	11/5/2015
6	Corn	Syngenta	MIR604xGA21	SYN-IR6Ø4-5xMON-ØØ21-9	11/5/2015
7	Corn	Monsanto	MON 87460	MON 8746Ø-4	8/2/2017
8	Corn	Monsanto	MON87427	MON-87427-7	1/23/2021
9	Corn	Dow AgroSciences LLC	DAS-40278-9	DAS-4Ø278-9	2/27/2021
10	Corn	DuPont (Pioneer Hi-Bred International Inc.)	4114	DP-ØØ4114-3	1/7/2022
11	Corn	Monsanto	MON87411	MON-87411-9	4/27/2022
12	Corn	Syngenta	MZIR098	SYN-ØØØ98-3	4/27/2022
13	Corn	Syngenta	5307	SYN-Ø53Ø7-1	10/13/2022
14	Corn	Monsanto	NK603XMON810	MON-ØØ6Ø3-6 x MON-ØØ81Ø-6	12/30/2022
15	Corn	Syngenta	Bt11	SYN-BTØ11-1	6/28/2024
16	Corn	DuPont Pioneer	DAS1507 (TC1507)	DAS- Ø15Ø7-1	6/28/2024
17	Corn	Dow AgroSciences LLC	DAS59122	DAS-59122-7	6/28/2024
18	Corn	Monsanto	NK603	MON-ØØ6Ø3-6	6/28/2024
19	Corn	Syngenta	GA21	MON-ØØØ21-9	6/28/2024
20	Corn	Monsanto	MON89034	MON-89Ø34-3	6/28/2024

21	Corn	Monsanto	MON88017	MON-88Ø17-3	6/28/2024
22	Soybean	Bayer CropScience	FG 72	MST-FGØ72-2	1/23/2021
23	Soybean	DuPont	DP305423	DP-3Ø5423-1	1/23/2021
24	Soybean	Monsanto	MON87701	MON-877Ø1-2	7/16/2015
25	Soybean	DuPont (Pioneer Hi-Bred International Inc.)	DP356043	DP-356Ø43-5	11/5/2015
26	Soybean	Bayer CropScience	A5547-127	ACS-GMØØ6-4	11/5/2015
27	Soybean	Monsanto	MON 87708	MON-877Ø8-9	8/2/2017
28	Soybean	BASF	CV127	BPS-CV127-9	8/2/2017
29	Soybean	Monsanto	MON87705	MON-877Ø5-6	8/2/2017
30	Soybean	Dow AgroSciences LLC	DAS-44406-6	DAS-444Ø6-6	2/27/2021
31	Soybean	Monsanto	MON89788	MON-89788-1	2/27/2021
32	Soybean	Monsanto	MON40-3-2	MON-Ø4Ø32-6	2/27/2021
33	Soybean	Bayer CropScience	A2704-12	ACS-GMØØ5-3	2/27/2021
34	Soybean	BASF	SYHT0H2	SYN-ØØØH2-5	1/7/2022
35	Soybean	Monsanto	MON87751	MON-87751-7	4/27/2022

36	Soybean	Dow AgroSciences LLC	DAS81419	DAS-81419-2	4/27/2022

Table 2: Pending Applications for Feed

No	Product	Developer	Event	OECD Unique Identifier	Application Date	Status
1	Soybean	Monsanto	MON 87769	MON-87769-7	4/30/2015	*Pending*
2	Canola	Monsanto	GT73 (RT73)	MON-ØØØ73-7	5/11/2015	*Pending*
3	Canola	Monsanto	MON88302	MON-883Ø2-9	5/11/2015	*Pending*
4	Canola	Bayer CropScience	MS8 RF3 MS8xRF3	ACS-BNØØ5-8, ACS-BNØØ3-6, ACS-BNØØ5-8 X ACS-BNØØ3-6	5/11/2015	*Pending*
5	Canola	Bayer CropScience	HCN28 (T45)	ACS-BNØØ8-2	5/11/2015	*Pending*
6	Soybean	Dow AgroSciences LLC	DAS-68416-4	DAS68416-4	7/13/2021	*Pending*
7	Corn	Monsanto	MON 87403	MON874Ø3-1	6/27/2022	*Pending*
8	Corn	Syngenta	MZHGOJG	SYN-ØØØJG-2	6/27/2022	*Pending*
9	Soybean	BASF	GMB151	BCS-GM151-6	6/27/2022	*Pending*
10	Cotton	Bayer CropScience		BCS-GHØØ2-5	3/25/2024	*Pending*

			GHB614			
11	Cotton	Monsanto	MON15985	MON-15985-7	3/25/2024	*Pending*
12	Cotton	BASF	T304-40	BCS-GHØØ4-7	3/25/2024	*Pending*
13	Cotton	Monsanto	MON531	MON-ØØ531-6	5/17/20224	*Pending*

c) STACKED or PYRAMIDED EVENT APPROVALS/AUTHORIZATIONS

Türkiye treats stacked events as novel and processes their approval separately from the approval of each individual event in the stack. The Committees follow the same assessment procedures followed for individual events.

d) FIELD TESTING

Currently, Türkiye does not have any field tests of products derived from agricultural biotechnology. The law's prohibition of cultivation and commercialization discourages the private and public sector from pursuing the development of GE products. TAGEM has been working on the process for allocating "specifically controlled fields" to scientists for research and development field trials but there is no publicly available information regarding this issue yet.

e) INNOVATIVE BIOTECHNOLOGIES

In MinAF's scientific community and some academic platforms, gene editing has been discussed for the last few years. However, Türkiye has not determined a regulatory status of innovative biotechnologies in plants or plant products of said technologies.

f) COEXISTENCE

Since the Biosafety Law prohibits the cultivation of agricultural biotechnology, there is no coexistence policy in place in Türkiye.

g) LABELING and TRACEABILITY

According to the Biosafety Law and implementing regulations, any approved imported food or feed containing, consisting of, or derived from GE crops above MinAF's labeling threshold of 0.9 percent must be labeled as a "Genetically Modified Organism (GMO)". For the bulk products, "GMO" information must be provided together with the products in question or must be visibly displayed immediately next to it for the final consumers. The conventional counterpart of any GE food or feed product may be labeled as "does not contain/consist of/derived from GMO" or "GMO Free."

Traceability clauses in the Biosafety Law and implementing regulations require that records be kept for a minimum of 20 years, detailing the unique identifier of the gene, quantity, supplier, and purpose of use, each time a product is processed or handled, from the time of import to the time of distribution to the market. In 2017, the Turkish government rolled out a computer system for recordkeeping and tracking the movement of GE feed ingredients and products. The business operator (any person at each stage of business, such as importer, distributor, wholesaler, retailer etc.) must submit documents which contain information related to the GE feed ingredients and products via the computer system to MinAF and keep the records for 20 years.

The implementing regulations also require that "genetically modified organisms and products" are processed and stored in separate production lines. In the event that this is not possible, the production lines and storage facilities must be cleaned to prevent any contamination with "genetically modified organisms and products" and the process must be recorded in the company's files.

h) MONITORING and TESTING

The government's monitoring and testing protocols for imported GE crops is not published. There is the potential for every shipment to be tested for GE content and the presence of unapproved GE traits. Designated local official laboratories conduct the import tests and the National Reference Laboratory in Ankara retests when results are contested. Products that receive a positive detection prior to customs clearance may be sent to another country or origin/exporting country or destroyed. The importer of a shipment found to contain an unapproved trait after clearing customs may be prosecuted for violating the Biosafety Law.

Post understands that Türkiye uses the quantitative PCR system for detecting, identifying, and quantifying GE content. Three main steps are typically followed in routine product analysis with qPCR methods. First, the potential presence of any GE event is assessed by a screening approach, targeting the most common transgenic elements found in GE events such as p35S (35S promoter from cauliflower mosaic virus) and tNOS (nopaline synthase terminator from *Agrobacterium tumefaciens*). Second, according to the positive and negative signals observed for the screening markers tested, GE events potentially detected are identified in a second step using qPCR techniques. Third, the amount of identified GE events present in the tested food/feed sample is determined. This quantification step is carried out based on the number of copies to allow the simultaneous identification of GE events.

i) LOW LEVEL PRESENCE (LLP) POLICY

Türkiye has a zero tolerance for LLP of GE events not approved in Türkiye for food, feed, and industrial products**,** subject to the liability provisions of the Biosafety Law. MinAF follows the approach of the Commission Regulation (EU) No: 619/2011 with legislation that allows trace amounts of unapproved biotech content in feed up to a "technical zero" level of 0.1 percent if the trait is currently being reviewed for approval.

On May 29, 2014, MinAF published a change to the regulation to define "contamination" and established a threshold of 0.9 percent for approved GE events in their "intended use." This wording implies that feed is the "intended use" category, because so far only events for feed use have been approved. Because GE events are approved only for feed use, the threshold does not provide any utility for detections in food. In practice, it seems the 0.9 percent "contamination" refers to the allowed limit of an approved event not listed on the import documentation as one of the GE events in that shipment.

j) ADDITIONAL REGULATORY REQUIREMENTS
Article 5 (1)(d) of the Biosafety Law prohibits the use of GE and products thereof in baby foods and infant formulas, follow-on formulas, and cereal-based supplementary foods for babies and young children.

Article 3(10) of the Biosafety Law requires MinAF's permission for each transshipment of products containing GE content.

k) INTELLECTUAL PROPERTY RIGHTS (IPR)
The cultivation of GE crops is prohibited under the Biosafety Law, and so protection for patented seeds does not apply.

l) CARTAGENA PROTOCOL RATIFICATION
Türkiye ratified the Cartagena Protocol on Biosafety (CPB) on October 24, 2003, and it entered into force on January 24, 2004. Türkiye took the CPB into consideration while preparing the Biosafety Law and its implementing regulations, but this body of legislation is not fully harmonized with the CPB. Türkiye sends a delegation to the CPB bi-annual Conference of the Parties serving as the Meeting of Parties on an irregular basis and does not actively participate in discussions. MinAF has a representative for the CPB Ad-Hoc Technical Expert Group on risk assessment.

m) INTERNATIONAL TREATIES and FORUMS
Türkiye is a member of several international organizations dealing with plant protection and plant health. These include the European and Mediterranean Plant Protection Organization (EPPO), the Organization for Economic Co-operation and Development (OECD), the Food and Agriculture Organization (FAO), International Plant Protection Convention (IPPC), and Codex. Türkiye does not actively participate in discussions related to GE plant or seed varieties with international organizations. MinAF participates at some of their meetings on an irregular basis.

n) RELATED ISSUES
Türkiye's Biosafety Law requires approval for use of products derived from agricultural biotechnology (excluding pharmaceuticals and cosmetics, which are in the scope of the Ministry of Health). Food, feed, and other industrial uses of products derived from plant biotechnology require a separate application and approval.

PART C: MARKETING

a) PUBLIC/PRIVATE OPINIONS
Due to anti-GE campaigns, especially in the few years right after the enactment of the Biosafety Law, public and private opinion in Türkiye is dominated by misinformation on possible hazards from the consumption of products derived from agricultural biotechnology. There is a misperception that consuming GE products is linked to health problems like cancer, allergies, and negative effects on hormones, etc. The Turkish government rarely refutes misinformation publicly, nor does it explain its process for reviewing the science and safety for the GE crops that are approved for use in Türkiye.

b) MARKET ACCEPTANCE/STUDIES

The fear surrounding biotechnology still continues among the Turkish public, producers, retailers, and consumers. This fear is mainly due to anti-GE campaigns run by local and international anti-biotech NGOs, such as the Chamber of Agricultural Engineers, Greenpeace, and the Friends of the Earth, as well as negative reporting in the media.

Although public sentiment is resoundingly anti-GE, Türkiye is import-dependent for plant-based protein for animal feed and some of these imported feed ingredients are GE. Misleading health stories, such as claims that eating chicken that was fed GE feed has negative health consequences, continue to show up in the media. However, sales of animal products derived from animals fed with GE feed does not appear to be affected by such media misinformation. Post is unaware of any marketing studies that have evaluated Turkish consumer sentiment towards products derived from agricultural biotechnology.

Graham Brookes of PG Economics in Great Britain published the study "Economic impacts of the Biosafety Law and Implementing Regulations in Turkey on the Turkish importing and user sectors" in May 2012. The study estimated the cost to the Turkish agricultural sector of Türkiye's restrictive regulatory system for biotech and concluded "…the ongoing annual cost can reasonably be expected to be between $0.7 billion and $1 billion and could be higher…".

The study was updated by Graham Brookes of PG Economics in the fall of 2022 and concluded "…the cost burden incurred by the Turkish agri-food sector as a result of the "GMO" regulations comes to between $1.53 billion and $2 billion between October 2009-December 2020…." The study has been distributed to the related stakeholders in Türkiye but has not yet been published online, as of October 2024.

CHAPTER 2: ANIMAL BIOTECHNOLOGY

PART D:
PRODUCTION AND TRADE

a) RESEARCH AND PRODUCT DEVELOPMENT
Article 5 of the Biosafety Law (Law No: 5977) bans the production of genetically engineered animals and plants.

b) COMMERCIAL PRODUCTION
GE animal production is banned.

c) EXPORTS
Not applicable.

d) IMPORTS
The Biosafety Law does not specifically ban imports of GE animals per se, but MinAF would first have to evaluate and approve an application for import. No application to import GE animals has been made.

e) TRADE BARRIERS
Not applicable.

PART E: POLICY

a) REGULATORY FRAMEWORK
Türkiye's regulation of agricultural biotechnology is governed by the Biosafety Law (Law No: 5977), which was adopted on March 26, 2010, and related implementing regulations. Imports of GE agricultural products, which includes GE animals, is only allowed after approval of each event based on the intended use. For more information, please see Chapter I/ Part B (a).

b) APPROVALS/AUTHORIZATIONS
There are no approvals for GE animals.

c) INNOVATIVE BIOTECHNOLOGIES
There is no regulatory status of animals or animal products derived from innovative biotechnologies.

d) LABELING and TRACEBILITY
Products derived from approved GE animals would require a label indicating that it is or contains GE content.

e) ADDITIONAL REGULATORY REQUIREMENTS
Not applicable.

f) INTELLECTUAL PROPERTY RIGHTS (IPR)
Not applicable.

g) INTERNATIONAL TREATIES and FORUMS
Türkiye is a member of World Organization for Animal Health (WOAH) and the U.N. Food and Agriculture Organization (FAO), which deals with animal health. Türkiye is not actively participating in discussions related to GE animals within these international organizations.

h) RELATED ISSUES
Not applicable.

PART F: MARKETING

a) PUBLIC/PRIVATE OPINIONS
Turkish public opinion would likely be against animal biotechnology.

b) MARKET ACCEPTANCE/STUDIES
There are no studies on consumer sentiment related to market acceptance of animal biotechnology.

CHAPTER 3: MICROBIAL BIOTECHNOLOGY

PART G: PRODUCTION AND TRADE

a) COMMERCIAL PRODUCTION

In contrast to plant biotechnology, the production of microbial biotechnology products is allowed. In 2020, MinAF issued its first approvals for three industrial enzymes made from the GE-improved *Aspergillus oryzae* fungus. Since that time, the Ministry has approved eight other enzymes made from the same GE fungus and one inactivated microbial mass for feed and other industrial usage purposes. Please see the approved and pending enzymes in Tables 3 and 4 in Part H(b) of this Chapter.

b) EXPORTS
The Turkish government does not keep trade statistics for enzymes derived from GE microorganisms or non-GE microorganisms.

c) IMPORTS
Imports of GE microorganisms require MinAF's approval, based on a scientific risk assessment and socio-economic evaluation. At this time, there are no approved GE microorganisms for import purposes.

MinAF requires a non-GE attestation provided by the competent authority of origin or exporting country, or an analysis report provided by an internationally recognized accredited laboratory for the microorganism to be imported. If this attestation is not provided, the product is not allowed to be imported and may be directed to another country or sent back to the origin country.

Based on the decision from the now-abolished Biosafety Board in 2015, a non-GE attestation is not required for the import of food ingredients such as enzymes, food additives, food processing aids, etc. derived from GE microorganisms. These ingredients are not checked at import to verify whether they are derived from GE or non-GE microorganisms. For this reason, there is no import data available for food ingredients derived from GE microorganisms.

D) TRADE BARRIERS
Post is unaware of any trade barriers for food ingredients such as enzymes, food additives, food processing aids, etc., derived from GE microorganisms.

PART H: POLICY

a) REGULATORY FRAMEWORK
MinAF is the regulatory authority for agricultural biotechnology. Production or import of GE microorganisms and products derived from GE microorganisms are only allowed after the approval of each microorganism and/or ingredient for each use. Please see detailed information on regulatory framework, which is also valid for microbial biotechnology, in Chapter 1, Part B, section (a) of this report.

Legal Terminology used in the Biosafety Law and Regulations			
Legal term (in official language)	**Legal term (in English)**	**Laws and Regulations where term is used**	**Legal Definition (in English)**
Genetik yapısı değiştirilmiş mikroorganizma (GDM)	"Genetically Modified	Biosafety Law	A micro-organism which

	Microorganism (GMM)"	"Regulation on Genetically Modified Organisms and Products" Regulation on the Working Principles of the Biosafety Board and the Committees	the genetic material has been altered in a way other than natural recombination.

b) APPROVALS/AUTHORIZATIONS

Article 3(1) of the Biosafety Law states that the contained use of GE microorganisms is only approved based on a scientific risk assessment. Production or import of GE microorganisms and products derived from GE microorganisms are only allowed after the approval of each microorganism and each ingredient for each use.

In 2018, following the private sector's applications to approve three different enzymes derived from GE *Aspergillus oryzae*, MinAF established a new Scientific Risk Assessment Committee specifically for reviewing the applications. Applications were also reviewed by the Socio-Economic Committee. To date, 11 enzymes produced by GE *Aspergillus oryzae* have been approved for feed and other industrial uses. In addition, one microbial mass (strengthened and inactivated GE *Aspergillus oryzae)* for feed purposes has been approved.

The approval timeframe is approximately one and half years from the application stage to the announcement of the decisions in the Official Gazette. Approvals are valid for 10 years.

Approvals are officially announced by the Turkish Government in the Official Gazette in Turkish. Please see approved and pending products from GE *Aspergillus oryzae* in Tables 3 and 4.

Table 3-Approved products from approved GE-*Aspergillus oryzae*

No	Microorganism	Developer	Unique Identifier Code	Product	Approval Date
1	*Aspergillus oryzae*	LIVZYM AS	LIVZ-101	Enzyme – Alpha-amylase (α-amylase)	5/6/2020
2	*Aspergillus oryzae*	LIVZYM AS	LIVZ-102	Enzyme – Glucoamylase	5/6/2020
3	*Aspergillus oryzae*	LIVZYM AS	LIVZ-103	Enzyme – Hemicellulase	

					5/6/2020
4	*Aspergillus oryzae*	LIVZYM AS	LIVZ-105	Enzyme Protease/Mucorpepsin EC 3.4.23.23	1/7/2022
5	*Aspergillus oryzae*	LIVZYM AS	LIVZ-104	Enzyme – Phytase	4/27/2022
6	*Aspergillus oryzae*	LIVZYM AS	LIVZ-106	Enzyme – Lipase/Triacylglycerol Lipase (EC 3.1.1.3)	10/13/2022
7	*Aspergillus oryzae*	LIVZYM AS	LIVZ-107	Enzyme – Glucose Oxidase (EC 1.1.3.4)	10/13/2022
8	*Aspergillus oryzae*	LIVYZM AS	LIV-108	Mixture of Endo-1,4-beta-glucanase (E.C.3.2.1.4) and Endo-1,4-beta-xylanase (EC 3.2.1.8)	10/13/2022
9	*Aspergillus oryzae*	BIOWASTE AS	BT-101	Inactivated microbial biomass	10/13/2022
10	*Aspergillus oryzae*	LIVYZM AS	LIV-109	Microbial Collagenase (EC 3.4.24.3)	6/28/2024
11	*Aspergillus oryzae*	LIVYZM AS	LIV-110	Phospholipase A1 (EC 3.1.1.32)	6/28/2024
12	*Aspergillus oryzae*	LIVYZM AS	LIV-111	*Protease* /Thermomycolin (EC 3.4.21.65)	6/28/2024

Table 4-Pending products from pending GE-*Aspergillus oryzae*

No	Microorganism	Developer	Product (Enzyme)	Application Date	Status
1	*Aspergillus oryzae*	LIVZYM AS	Chymosin		

			(EC 3.4.23.4)	*5/5/2023*	*Pending*
2	*Aspergillus oryzae*	LIVZYM AS	Asparaginase (EC 3.5.1.1)	*5/5/2023*	*Pending*

c) LABELING and TRACEABILITY
Based on the decision of the abolished Biosafety Board, ingredients such as enzymes, food additives, and food processing aids that are derived from GE microorganisms do not require GE labelling nor tracing. These ingredients are labelled according to Law No. 5996 on Veterinary Services, Phytosanitary, Food, and Feed that is enforced by MinAF to ensure food and feed safety and inform consumers about ingredients of foods.

d) MONITORING and TESTING
There is no testing requirement for evidence of GE in imported or exported products containing GE microorganism-derived ingredients, such as enzymes, food additives, food processing aids, etc. These products are not monitored in the aspect of being derived from GE microorganisms.

e) ADDITIONAL REGULATORY REQUIREMENTS
Not applicable.

f) INTELLECTUAL PROPERTY RIGHTS (IPR)
The Law on Industrial Property No.6769 was entered into force by its publication in the Official Gazette dated January 10, 2017. Law No. 6769 is an enforceable piece of legislation regulating trademarks, patents, designs, utility models, geographical indications, and traditional product names in line with EU standards and Türkiye's local requirements. It encompasses applications, registrations and post-registration processes regarding trademarks, geographical signs, design, patent, utility model and traditional product names and legal and criminal sanctions concerning the violation of these rights. Currently, there are no protected or registered microbial biotechnology products.

g) RELATED ISSUES
Not applicable

PART I: MARKETING

a) PUBLIC/PRIVATE OPINIONS
Misinformation on possible hazards from the consumption of products derived from agricultural biotechnology has continued to be disseminated by anti-GE campaigns and non-science-based reporting in the media. However, the Turkish government has supported the production of enzymes derived from GE microorganisms for industrial usage purposes based on the idea that the enzymes themselves are not GE since they do not have DNA. There is no negative public or private opinion on the production of enzymes by modern biotechnology.

b) MARKET ACCEPTANCE/STUDIES

There is no market acceptance studies or research on microbial biotechnology in Türkiye.

Further Information: For the most up-to-date reports on Türkiye's agriculture situation and policies, use the search function at https://gain.fas.usda.gov/#/ or visit our website: https://www.fas.usda.gov/.

Attachments:

No Attachments