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**Report Highlights:**

The United Arab Emirates aims to build a technologically sophisticated, knowledge-based exporting economy. Its indigenous flora are characterized by genes that tolerate a challenging environment of high temperature, drought, and salinity. The date palm, the country's most important crop, enjoys demand regionally for its seedlings that are produced through micropropagation regeneration.

# **AGRICULTURAL BIOTECHNOLOGY ANNUAL 2023**

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## EXECUTIVE SUMMARY

- The United Arab Emirates (UAE) has been named one of the top three most innovative economies in the Middle East.
- The country has a chain of institutes and research centers that support research and development of biotechnology.
- Genetically engineered food with less than 0.9 percent of components derived from bioengineering may be imported.
- Ingredients and composition of imported or locally produced food must be registered.
- In 2009, the UAE produced the world's first cloned camel.
- DuBiotech is the first free zone in the Middle East to serve the science sector.
- See [GAIN Report TC2020-0024](#), "UAE Passes New Mandatory Biotech Labeling Law," for additional information.

## CHAPTER 1: PLANT BIOTECHNOLOGY

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

#### **a) RESEARCH AND PRODUCT DEVELOPMENT**

Research has shown that the genes of the UAE's indigenous plants (halophytes and non-halophytes) living in harsh environments are tolerant and resistant to high temperature, drought, and salinity given the nature of the harsh environment.<sup>1</sup> These unique genes could be used to green the deserts and improve crops. As a result, UAE universities and research institutes in the last 10 years have more closely examined the value of the UAE's flora.

- The University of Sharjah offers a Bachelor of Science in Biotechnology that started in 2008.
- The United Arab Emirates University inaugurated [The Khalifa Center for Genetic Engineering and Biotechnology](#) in 2014. It focuses on exploring flora of the arid region to generate scientific knowledge and address the global challenges in food security and sustainable agriculture practices through genomics, genetic engineering, and biotechnological innovation. A goal is increasing the ability of plants to tolerate drought, heat, and salt.
- Khalifa University established [The Khalifa University Center for Biotechnology](#) in 2015 to develop the university's capabilities in training and research to respond to the priority areas of the UAE 2030 vision.

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<sup>1</sup> Gairola, Sanjay et al. "Strengthening desert plant biotechnology research in the United Arab Emirates: a viewpoint." *Physiology and molecular biology of plants: an international journal of functional plant biology* vol. 24,4 (2018): 521-533.

- [The International Center for Biosaline Agriculture](#) is an international, not-for-profit applied agricultural research center established to identify, test, and introduce smart crops and technologies that are best suited to different regions. These crops may be affected by salinity, water scarcity, and drought by developing new resilient and nutritious varieties of these crops by combining genetic and genomic approaches.
- [Masdar Institute of Science and Technology](#) is a graduate-level university with a focus on alternative energy and sustainable technologies including biofuels from halophytes. Masdar Institute was established with the cooperation of the Massachusetts Institute of Technology to support building a knowledge-based and technology exporting economy in Abu Dhabi.
- The Biotechnology Research Center (BRC) is part of the [Technology Innovation Institute \(TII\)](#). TII belongs to the Abu Dhabi Government's Advanced Technology Research Council (ATRC). BRC utilizes recent advances in molecular, cellular, and digital technologies to develop human expertise for better healthcare outcomes through molecular and genomics strategies to enhanced bioinformatics and biomedicine.
- [The Advanced Technology Research Council](#) is the overarching advanced technology research body in Abu Dhabi and more broadly in the UAE. ATRC is responsible for defining Abu Dhabi's research strategy across academia and industry, consolidating and facilitating efficient investment funding, and driving policy and regulation for agile decision-making. It also contributes to Abu Dhabi's knowledge economy through commercialization of research and development outputs locally and globally. ATRC priority sectors include healthcare, food and agriculture, Sustainability, Environment and Energy, aerospace, safety and security, and transport.

#### **b) COMMERCIAL PRODUCTION**

The date palm (*Phoenix dactylifera*) is one of the most important crops in the UAE and the Gulf. Micropropagation regeneration of date palm through tissue culture (*in vitro* propagation) techniques is sometimes used to induce mutations to improve fruit yield and increase tolerance to salinity and drought stress.

[The Date Palm Tissue Culture Laboratory \(DPTCL\)](#), which belongs to the United Arab Emirates University, is recognized internationally as one of the key mass propagation units for dates. According to the DPTCL, the UAE contains around 40 million palm trees including 120 date varieties. Media reports mentioned that the production capacity of DPTCL is 40,000-50,000 seedlings per year to meet the regional demand on date seedlings through exporting high-quality varieties to major export markets at Egypt, India, Iraq, Jordan, Oman, Saudi Arabia, and Thailand.

#### **c) EXPORTS**

Information not available.

**d) IMPORTS**

The UAE allows import of agricultural products containing a maximum of 0.9 percent in components derived from bioengineered sources per [Federal Law No. 9 of 2020](#) (see also [GAIN Report TC2020-0024](#)).

**e) FOOD AID**

Approximately 80 percent of the UAE’s agricultural products are imported. The UAE provides food aid to countries in need (mainly to Chad, Sudan, Ethiopia, and Afghanistan) through humanitarian organizations such as the [Emirates Red Crescent](#), [Zayed bin Sultan Al Nahyan Charitable and Humanitarian Foundation](#), and [Khalifa bin Zayed Al Nahyan Foundation](#).

**f) TRADE BARRIERS**

None.

**PART B: POLICY**

**a) REGULATORY FRAMEWORK**

In May 2020, the United Arab Emirates passed [Federal Law no. \(9\) of 2020](#) and its related [implementing regulations](#) on the import, export, re-export, transit, trading, development, manufacture, production and transfer of food and agricultural products containing 0.9 percent or more in components derived from bioengineering. This biosafety law requires that companies obtain a permit to import genetically engineered (GE) products into the UAE and requests the creation of a registry of applications. It also outlines requirements for labeling of GE food products and describes penalties if rules are broken.

Legal term (in Arabic)	Legal Term (in English)	Laws and Regulations where term is used	Legal Definition (in English)
التحوير الوراثي	genetic modification	Federal Law No. (9) of 2020	modification of genetic material using modern biotechnology
الكائن المحور وراثيا	genetically modified organism	Federal Law No. (9) of 2020	organism having a new combination that is different of its original combination of genetic materials obtained using modern biotechnology
التكنولوجيا الاحيائية الحديثة	modern biotechnology	Federal Law No. (9) of 2020	application of <i>invitro</i> techniques for deoxyribonucleic acid (DNA) and direct injection of DNA into cells or organelles, or integrating cells until they fall outside their taxonomic rank and overcome the natural

			physiological barriers of reproduction or recombination, and they are not considered techniques used in natural breeding and selection
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**b) APPROVALS/AUTHORIZATIONS**

Information not available.

**c) STACKED OR PYRAMIDED EVENT APPROVALS/AUTHORIZATIONS**

Not applicable.

**d) FIELD TESTING**

Not applicable.

**e) INNOVATIVE BIOTECHNOLOGIES**

Not applicable.

**f) COEXISTENCE**

Not applicable.

**g) LABELING AND TRACEABILITY**

The importer, exporter, trader, developer, manufacturer, and producer of genetically engineered commodities or their products shall place an information label on each package. The label must state that the product contains “Genetically Modified Organisms or their products” and any other information as determined by the law’s [implementing regulation](#) (Ministerial Decree 84 of 2020).

**h) MONITORING AND TESTING**

Dubai Municipality’s Dubai Central Laboratory uses real-time polymerase chain reaction technique to screen food samples to ensure the conformity of GE food with labels and local standards. The UAE has several other accredited laboratories with the capacity to monitor and test for GE products if needed:

- Al Hoty Stanger Laboratories ICAD, Abu Dhabi
- SGS Gulf Food and Chemical Testing Laboratory, Dubai
- Inspectorates International Limited, Dubai
- Holistic International Testing Services, Dubai
- Advance Biotechnology Center, Dubai

**i) LOW LEVEL PRESENCE POLICY**

Not applicable.

**j) ADDITIONAL REGULATORY REQUIREMENTS**

[Ministerial Decree No. 239 of 2018 on National Food Accreditation and Registration](#)

[System](#) mandates that imported, locally produced, or modified food, ingredients, or composition must be registered in [ZAD](#) prior to reaching the market. ZAD is an integrated smart platform for food product data.

**k) INTELLECTUAL PROPERTY RIGHTS**

Not applicable.

**l) CARTAGENA PROTOCOL RATIFICATION**

The UAE ratified the Cartagena Protocol on Biosafety to the Convention on Biological Diversity in July 2014 through [Federal Decree No. \(77\) of 2014](#).

**m) INTERNATIONAL TREATIES AND FORUMS**

<b>Convention Name</b>	<b>Status</b>	<b>Date of Approval, Acceptance, Accession, or Ratification</b>
Regional Organization for the Protection of the Marine Environment	Ratified	April 1, 1979
Protocol Concerning Regional Cooperation in Combating Pollution by Oil And Other Harmful Substances In Cases Of Emergency to the Kuwait	Ratified	April 1, 1979
The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	Ratified	March 3, 1990
Convention on International Trade in Endangered Species of Wild Fauna and Flora	Ratified	May 9, 1990
Protocol Concerning Marine Pollution resulting from Exploration of the Continental Shelf	Ratified	July 16, 1990
United Nations Framework Convention on Climate Change	Ratified	November 20, 1995
Agreement on the Application of Sanitary and Phytosanitary Measures	Accession	April 10, 1996
United Nations Convention to Combat Desertification	Ratified	October 21, 1998

Convention on Biological Diversity	Ratified	November 24, 1999
Stockholm Convention on Persistent Organic Pollutants	Ratified	July 11, 2002
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	Ratified	August 11, 2002
The International Treaty on Plant Genetic Resources for Food and Agriculture (CGRFA)	Ratified	January 24, 2004
Kyoto Protocol to the United Nations Framework Convention on Climate Change	Ratified	December 29, 2004
Vienna Convention for the Protection of the Ozone Layer	Ratified	December 29, 2004
Montreal Protocol on Substances that Deplete the Ozone Layer	Ratified	December 29, 2004
Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer	Ratified	February 16, 2005
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Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer	Ratified	February 16, 2005
International Plant Protection Convention	Accession	October 2, 2005
Convention on Wetlands of International Importance - Ramsar	Ratified	February 6, 2007



Protocol Nagoya - Kuala Lumpur Supplementary to the Cartagena Protocol on Biosafety on liability and redress	Ratified	July 23, 2014
Cartagena Protocol on Biosafety	Ratified	July 23, 2014
Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their use	Ratified	July 23, 2014
Intergovernmental Platform on Biodiversity and Ecosystem Services	Ratified	January 11, 2015
Minamata Convention on Mercury	Ratified	March 25, 2015
Convention on the Conservation of Migratory Species of Wild Animals	Ratified	May 24, 2015

Source: Ministry of Climate Change and Environment

**n) RELATED ISSUES**

Not applicable.

**PART C: MARKETING**

**a) PUBLIC/PRIVATE OPINION**

There is a lack of awareness on GE food. Most consumers are skeptical of biotechnology without basing their opinions on science. Media reports generally express concern on potential negative environmental and biodiversity effects, rather than on potential positive benefits to society.

**b) MARKET ACCEPTANCE/STUDIES**

Information not available.

**CHAPTER 2: ANIMAL BIOTECHNOLOGY**

**PART D: PRODUCTION AND TRADE**

**a) RESEARCH AND PRODUCT DEVELOPMENT**

The [Reproductive Biotechnology Center \(RBC\)](#) focuses its research on the development and application of latest biotechnology techniques for the production and multiplication of elite animals and preservation of endangered species of the region. RBC successfully

produced the world's first calf from a cloned camel in 2009 named "Injaz." The camel was cloned using ovarian cells of a camel; it was then conceived and delivered naturally.

UAE-based International Foodstuffs Company (IFFCO) has announced the launch of the "Thryve" brand as the first plant-based meat factory in Gulf Cooperation Council (GCC) region. IFFCO has been reported to be working with the UAE government to set regulatory standards for plant-based meat.

**b) COMMERCIAL PRODUCTION**

Not applicable.

**c) EXPORTS**

Not applicable.

**d) IMPORTS**

See Chapter 1, part A, sub-paragraph d.

**e) TRADE BARRIERS:**

None.

**PART E: POLICY**

**a) REGULATORY FRAMEWORK**

See Chapter 1, paragraph B, sub-paragraph a.

**b) APPROVALS/AUTHORIZATIONS**

See Chapter 1, paragraph B, sub-paragraph b.

**c) INNOVATIVE BIOTECHNOLOGIES**

Not applicable.

**d) LABELING AND TRACEABILITY**

See Chapter 1, paragraph B, sub-paragraph g.

**e) ADDITIONAL REGULATORY REQUIREMENTS**

See Chapter 1, paragraph B, sub-paragraph j.

**f) INTELLECTUAL PROPERTY RIGHTS (IPR)**

See Chapter 1, paragraph B, sub-paragraph k.

**g) INTERNATIONAL TREATIES AND FORUMS**

See Chapter 1, paragraph B, sub-paragraph m.

**h) RELATED ISSUES**

See Chapter 1, paragraph B, sub-paragraph n.

## **PART F: MARKETING**

- a) **PUBLIC/PRIVATE OPINIONS**  
See Chapter 1, paragraph C, sub-paragraph a.
- b) **MARKET ACCEPTANCE/STUDIES**  
See Chapter 1, paragraph C, sub-paragraph b.

## **CHAPTER 3: MICROBIAL BIOTECHNOLOGY**

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

- a) **COMMERCIAL PRODUCTION**  
[Dubai Biotechnology and Research Park \(DuBoiotech\)](#) is the first free zone in the Middle East dedicated to meeting the needs of the science sector. DuBiotech was established to serve the entire value chain of the science, health, and pharma sectors. The aim is to foster an environment that supports research, creativity, and innovation to support a knowledge-based economy.  
  
According to [Global Innovation Index 2022](#), the UAE is one of the top three innovative economies in the North Africa and Western Aisa region. It is ranked second after Israel. Relative to its GCC peer countries, the UAE is ranked 31 globally, Saudi Arabia ranked 51, Qatar ranked 52, Kuwait ranked 62, Bahrain ranked 72, and Oman ranked 79.
- b) **EXPORTS**  
Information not available.
- c) **IMPORTS**  
See Chapter 1, part A, sub-paragraph d.
- d) **TRADE BARRIERS**  
None.

## **PART H: POLICY**

- a) **REGULATORY FRAMEWORK**  
See Chapter 1, paragraph B, sub-paragraph a.
- b) **APPROVALS/AUTHORIZATIONS**  
See Chapter 1, paragraph B, sub-paragraph b.
- c) **LABELING AND TRACEABILITY**

See Chapter 1, paragraph B, sub-paragraph g.

**d) MONITORING AND TESTING**

See Chapter 1, paragraph B, sub-paragraph h.

**e) ADDITIONAL REGULATORY REQUIREMENTS**

See Chapter 1, paragraph B, sub-paragraph j.

**f) INTELLECTUAL PROPERTY RIGHTS**

See Chapter 1, paragraph B, sub-paragraph k.

**g) RELATED ISSUES**

See Chapter 1, paragraph B, sub-paragraph n.

**PART I: MARKETING**

**a) PUBLIC/PRIVATE OPINIONS**

See Chapter 1, paragraph C, sub-paragraph a.

**b) MARKET ACCEPTANCE/STUDIES**

See Chapter 1, paragraph C, sub-paragraph b.

**Attachments:**

No Attachments