AGRITECH
منتـــدى التكنـــولـوجيـــا الزراعيـــة

POST-EVENT REPORT 2025

Part of

GLOBAL FOOD WEEK 2025
الأسبوع العالمي للغذاء

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EMPOWERING LOCAL
FOOD SUPPLY CHAINS.
**FROM FARM
TO FORK.**

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مؤتمر التكنولوجيا الزراعية

Global Food Week 2025 (GFW) brought together the world's food system community in Abu Dhabi at a moment when global agriculture is being reshaped by climate pressures, technological acceleration, and new investment priorities. **Organized under the patronage of H.H. Sheikh Mansour bin Zayed Al Nahyan and hosted by ADNEC Group in collaboration with the Abu Dhabi Agriculture and Food Safety Authority (ADAFSA)**, the event functioned less as an exhibition and more as a policy and innovation marketplace - where ideas, technologies, and partnerships converged to address the central challenge of building resilient food systems.

This year's edition positioned agriculture and technology not as separate domains but as a shared field of experimentation. The AgriTech & Farmers track - one of GFW's five integrated sectors - explored how digital tools, automation, and data intelligence are redefining farming efficiency and environmental performance. Within this track, the AgriTech Forum served as a focal point for technical exchange, featuring policymakers, startups, investors, and research institutions. Sessions examined how artificial intelligence, controlled-environment systems, and regenerative practices can balance productivity gains with long-term resource stability, particularly in water-scarce and heat-stressed environments such as the Gulf region.

Running parallel to these applied discussions, the Global Food Talks (GFT) series created space for a different kind of dialogue - high-level but solution-oriented. It convened ministers, business leaders, and scientists to connect technological innovation with food policy, trade architecture, and climate adaptation. Rather than reiterating challenges, the conversations at GFT pointed toward actionable frameworks for collaboration, including cross-border R&D platforms, sustainable investment pipelines, and shared regional data systems.

Together, GFW, the AgriTech Forum, and Global Food Talks framed a more integrated narrative of the food system — one that sees agriculture not just as production, but as infrastructure for resilience. The discussions reflected a growing consensus: that the future of food security will depend on the speed and inclusivity of the agritech transition, and on how effectively innovation ecosystems can align with national policy and private investment.

EVENT OVERVIEW

The AgriTech Forum, held from 21–23 October 2025 as part of Global Food Week (GFW) at the Abu Dhabi National Exhibition Centre (ADNEC), brought together international experts, policymakers, investors, and innovators to examine the changing landscape of agriculture through three interconnected themes — Farming Innovation, Investment, and Education. Organized by the Abu Dhabi Agriculture and Food Safety Authority (ADAFSA) under the umbrella of GFW, the forum served as a structured dialogue on how technology, policy, and knowledge exchange can collectively drive a sustainable and resilient agrifood future.

OBJECTIVES

The forum aimed to **advance the integration of technology** in agriculture through innovation, digitalization, and climate-smart practices.

Encourage investment in emerging agritech ventures and infrastructure that enable self-sufficiency and circular food economies.

Build research and education linkages to strengthen talent, scientific inquiry, and capacity within the UAE's agricultural ecosystem.

FORUM STRUCTURE

Each day focused on a distinct pillar, creating a logical progression from field-level innovation to system-level investment and knowledge dissemination.

DAY 1 - FARMING INNOVATION

The opening day focused on reimagining primary production systems through technology and sustainable practices. Sessions explored digitizing agricultural value chains, building Africa–GCC innovation corridors, and reskilling traditional farmers for digital-first food economies. Technical discussions addressed water management in date palm cultivation and the urgent need to reduce antimicrobial use in animal production.

DAY 2 - INVESTMENT

The second day emphasized the economic dimension of agritech — financing, market access, and scaling innovation. It featured insights from **H.E. Dr. Tareq Al-Ameri (ADAFSA)** and sector leaders on investment legislation, CEPA-driven export opportunities, and indoor farming potential in the UAE. Panels and fireside chats examined pathways for transforming agrifood waste into commercial value, leveraging digital farming and AI, and the evolving role of banks in agricultural financing. **The day concluded with the ADAFSA Awards Ceremony** recognizing achievements in sustainable agriculture and innovation.

DAY 3 - EDUCATION

The final day turned to research, training, and knowledge transfer — essential components of long-term food system resilience. Presentations highlighted scientific advances in livestock health, bee disease management, molecular diagnostics for emerging pathogens, and plant-based protein innovation. Researchers from leading institutions, including the University of Illinois Urbana-Champaign, McGill University, and University Putra Malaysia, discussed food processing, crop adaptation, and sustainable production methods. The sessions reinforced the role of education and R&D as foundational to the UAE's agritech ambitions.

DAY 1

WELCOME NOTE

Mira El Ghaziri
Managing Director
Healthy Path Consultancy

The AgriTech Forum at Global Food Week 2025 opened with welcoming remarks by Mira El Ghaziri, who set the tone for three days of dialogue on innovation, investment, and education as the key levers for transforming global agriculture. Addressing a diverse audience of policymakers, investors, researchers, and industry leaders, she emphasized Abu Dhabi's growing role as a hub for agricultural innovation and collaboration.

In her remarks, El Ghaziri framed the forum's central question — how can innovation and sustainability together ensure food security for future generations? — and underscored that progress in agriculture requires a collective, cross-sector effort rather than isolated initiatives. **She highlighted the importance of uniting farmers, researchers, policymakers, and investors to co-create scalable and sustainable solutions.**

SESSION

DRIVING INNOVATION ACROSS THE AGRICULTURAL VALUE CHAIN

Marc Bou Zeidan
Cluster Executive Director | QOOT

The session explored how innovation in the agri-food sector has evolved over the past two decades and how business clusters can bridge the gap between invention and large-scale adoption. Focusing on the theme "From Patents to Practice," Bou Zeidan analyzed global patent trends and highlighted that more than 1.5 million agri-food patents have been filed since 2000—around 10 percent of global intellectual-property activity.

He emphasized that agriculture today faces not a shortage of ideas but a challenge of adoption and scaling. Existing solutions in biotechnology, digital farming, and climate-smart systems must be effectively transferred to producers and SMEs to generate tangible outcomes.

KEY INSIGHTS

SHIFTING INNOVATION PRIORITIES

The sector has moved from chemical inputs in the early 2000s, to biotech and genomics in the 2010s, and now to AI, IoT, sensors, and climate-adaptive technologies in the 2020s. Biological and environmental patents now surpass chemical ones, signaling a structural shift toward sustainability.

HIGH-GROWTH TECHNOLOGY AREAS

Digital and precision farming, agri-robotics, controlled-environment systems, soil and biological inputs, and genetic improvement are expanding rapidly. In food tech, alternative proteins and circular production systems could supply 30 percent of global protein demand by 2050.

BUSINESS CLUSTERS AS ENABLERS

Clusters—geographic networks of interconnected companies and institutions—serve as the mechanism that converts innovation into competitiveness. They enhance SME productivity, accelerate technology transfer, and create coordinated green-transition strategies. European experience shows productivity gains of 15–130 percent within cluster ecosystems.

UAE POLICY MOMENTUM

The UAE's new National Policy for Business Clusters 2051, aligned with the National Food Security Strategy, recognizes clusters as a central pillar of innovation and allocates USD 18 billion annually to drive adoption and competitiveness in priority sectors such as food.

PRACTICAL EXAMPLE

The QOOT cluster in Lebanon grew from seven to over 130 companies since 2018, linking farmers, processors, and exporters. It demonstrates how coordinated clustering can streamline value chains, reduce intermediaries, and improve sustainability performance.

CHALLENGES

- **Absence of unified governance for cluster initiatives.**
- **Fragmented R&D and weak university industry links.**
- **Limited IP commercialization and technology transfer.**
- **Low SME collaboration and data-sharing culture.**
- **Shortage of trained cluster management professionals.**

Overcoming these will determine whether clusters become genuine economic ecosystems or merely branding exercises. The discussion reframed agritech advancement as a systems transformation, not a technology race. The UAE's emerging cluster policy provides a framework for converting existing inventions into scalable, locally adapted innovations capable of strengthening food-system resilience in the decades ahead.

SESSION

FROM ASYMMETRY TO ALLIANCE
A DIGITAL FOOD CORRIDOR AFRICA → GCC

Daniel Annerose
CEO, Manobi Africa

This session focused on redefining Africa–GCC relations through digital integration and data-driven agriculture. Annerose proposed a practical framework for building a "Digital Food Corridor" — a traceable, transparent, and investable agricultural supply chain connecting Africa's production capacity with the GCC's technological and financial strength.

He opened with a simple premise: while Africa and the GCC face opposing resource realities, their differences create an opportunity for strategic alignment. Africa offers vast arable land, water resources, and labor; the GCC contributes capital, logistics expertise, and advanced agritech. When connected through shared digital standards and transparent data systems, this "asymmetry" becomes the basis for an alliance that enhances regional food security and global supply chain resilience.

KEY INSIGHTS

SHARED OPPORTUNITY, DIFFERENT STRENGTHS

Africa's agricultural potential is constrained by limited financing and fragmented value chains. The GCC faces the reverse—strong infrastructure but scarce land and water. Collaboration through digital systems can create complementary value.

INTEGRATION WITH THE UAE ECOSYSTEM

The model is being piloted by linking African agricultural data layers to UAE's AI and agritech hubs, establishing a common digital language and standardized quality protocols between both regions.

FINANCING REFORM THROUGH TECHNOLOGY

In Sub-Saharan Africa, only 4% of total bank credit goes to agriculture, and less than 2% reaches farmers on time. The legacy model focuses on individual credit risk, while the proposed digital model shifts toward assessing the viability of entire value chains — measuring collective performance rather than individual repayment capacity.

FOUR CORRIDOR PRINCIPLES

The corridor is designed around being on track (traceable), on specs (quality-certified), on time (logistically reliable), and on value (socially and environmentally responsible).

THREE-PILLAR DIGITAL FRAMEWORK

1. **Precision mapping –** using satellite imagery, IoT, and AI to quantify every farmer's assets, productivity, and land potential.
2. **Coordinated value chains –** connecting all actors (farmers, buyers, logistics, and regulators) through a single digital platform that enhances transparency and contract reliability.
3. **Real-time monitoring –** tracking production and logistics from land preparation to delivery, enabling early detection of risks and ensuring quality, traceability, and timeliness.

KEYNOTE ADDRESS

RESKILLING TRADITIONAL FARMERS FOR A DIGITAL FIRST AGRIFOOD ECONOMY

Satyam Bose
Founder & CEO, Virenxia

This keynote examined one of the most pressing transitions in modern agriculture — the human dimension of digital transformation. Bose argued that technology alone cannot modernize agriculture unless farmers are reskilled, empowered, and emotionally connected to the process of change. His central message was that **"technology doesn't change farming people do."** Drawing on experiences from India and the UAE, he described how smallholder farmers and controlled-environment growers face vastly different realities but share the same need: confidence in using data-driven tools without losing their generational knowledge. Bose positioned reskilling not as technical training but as cultural adaptation, where trust, ownership, and collaboration are key to transformation.

KEY INSIGHTS

THE ECSSA FRAMEWORK

Virenxia's Digitally Enabled Climate-Smart Sustainable Agriculture (ECSSA) model integrates

1. **Bio-Ag innovations –** natural alternatives to chemical inputs that maintain high yields.
2. **Agri-TMS –** a portable IoT-based soil and water testing kit delivering GPS-tagged, tamper-proof, real-time results.
3. **AI-driven advisory –** a digital coach offering crop-specific guidance through mobile alerts and dashboards.

Together, these tools turn data into a daily decision-making companion for farmers. delivery, enabling early detection of risks and ensuring quality, traceability, and timeliness.

THE CHALLENGE OF DIGITAL ADOPTION

Farmers operate in volatile conditions — unpredictable weather, shifting markets, and growing environmental stress. Expecting immediate digital adoption without context or training is unrealistic. The goal is to blend traditional intuition with digital intelligence, not replace it.

FIELD-LEVEL RESKILLING

Training is embedded within communities, not classrooms. Bose shared the case of a young agripreneur in Maharashtra who became a "tech enabler" for local farmers after ECSSA training — an example of peer-driven transformation that spreads organically through practice and trust.

ADAPTING TO GULF REALITIES

In the UAE, Virenxia supports farmers in controlled-environment systems, helping them navigate certification, water management, and market access. By integrating Agri-TMS into WhatsApp-based interfaces, farm owners can receive live soil and water data, GIS coordinates, and carbon-tracking reports — a new form of "comfort farming with tech."

SOCIO-ECONOMIC OUTCOMES

The shift to digital competence yields measurable benefits

1. Farmers begin trusting data alongside intuition.
2. Profitability improves through reduced waste and optimized inputs.
3. Farms become more climate-resilient with healthier soil and water cycles.
4. Younger generations return to agriculture, perceiving it as a modern, aspirational career.

Bose's keynote **reframed reskilling as the moral and practical foundation of agritech progress. The future farmer, he suggested, will "wear two hats — one made of straw and one powered by silicon."** By blending biological knowledge with digital literacy, farmers can evolve from passive producers to empowered innovators who not only feed the world but also regenerate ecosystems and rural economies.

FIRESIDE CHAT

GROWING DATES IN A THIRSTY WORLD

TACKLING WATER CHALLENGES IN PALM CULTIVATION

Dr. Eman Soliman
Irrigation Specialist, FAO

The discussion examined how the region can sustain date palm—a culturally iconic, water-intensive crop—under tightening groundwater constraints and rising salinity. The focus was practical: replace legacy flood irrigation with modern, monitored systems, diversify water sources where safe, and build the policy and skills infrastructure that make efficiency stick.

KEY INSIGHTS

SCALE OF THE WATER PROBLEM

Traditional flood irrigation has depleted aquifers and accelerated soil salinization in major oases; date palm is among the region's highest irrigation consumers.

PROVEN ON-FARM SOLUTIONS NOW IN USE (KSA PILOTS)

- **Subsurface/drip (bubbler) irrigation to cut losses and target the root zone.**
- **Smart irrigation with soil-moisture sensors and weather-linked controls (automatic rain shutoff).**
- **Owner dashboards / mobile control, reducing reliance on manual operation.**
- **Fertigation + filtration to pair precise watering with nutrient delivery.**

ALTERNATIVE WATER SOURCES (WITH SAFEGUARDS)

- **Treated wastewater** (TWW) is being used for date palms in Saudi Arabia under a national program, with monitoring of soil salinity/quality and mixing with groundwater where needed.
- **Crop eligibility is code-based** (trees like date palm permitted; vegetables restricted). Rigorous lab monitoring is essential; open question raised on antimicrobial-resistance genes merits further study and disclosure.

TECHNOLOGIES TO WATCH

Hydroponics for date palm remains in research-stage (nursery/transplant applications possible). Whole-farm adoption is not yet viable due to scale, energy, and economics of a long-lived tree crop.

POLICY & GOVERNANCE PRIORITIES

- Metering/licensing of groundwater abstraction; set farm-level allocations.
- National/regional water productivity monitoring (e.g., satellite-based evapotranspiration) to shift debate from "saving water" to "more yield per drop."
- Incentives (capex offsets) to help farmers convert from flood to modern systems

ADOPTION BARRIERS & HOW TO OVERCOME THEM

- Farmer acceptance → demonstration on extension farms, peer-to-peer proof at harvest.
- Capacity gaps → vocational training (irrigation academies) for installation, O&M, and service networks.
- Upfront costs → targeted public incentives and private-sector service models.

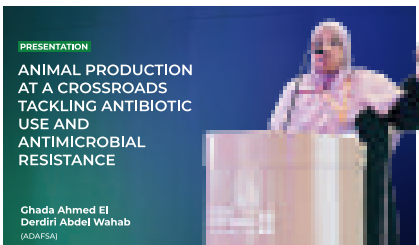
REGIONAL ROADMAP

FAO work piloted in Saudi Arabia with intent to scale GCC-wide via an integrated program covering irrigation, agronomic practices, and monitoring.

FUTURE OUTLOOK (10–15 YEARS)

A realistic target is ≥70% adoption of modern irrigation among date growers across the GCC—enough to materially reduce groundwater stress, improve fruit quality, and stabilize soils—while preserving cultural practices (orchard layout, intercropping) where they don't compromise water outcomes.

Sustaining date palm at scale is achievable through a package: efficient hardware, real-time monitoring, safe supplemental water, and enabling policy plus skills. The crop's heritage can be preserved—but irrigation must modernize.



PRESENTATION

ANIMAL PRODUCTION AT A CROSSROADS TACKLING ANTIBIOTIC USE AND ANTIMICROBIAL RESISTANCE

Ghada Ahmed El Derdiri Abdel Wahab
(ADAFSA)

The session framed AMR as a near-term risk to animal, human, and environmental health, with livestock systems a major pressure point. While livestock underpins food security, livelihoods, and "protein resilience," escalating and often misdirected antimicrobial use is eroding treatment efficacy and raising costs across health systems. The talk connected global evidence to UAE actions, highlighting recent policy bans, surveillance tools, and One Health programs aimed at cutting misuse without compromising animal health or productivity.

KEY INSIGHTS

WHY ANTIBIOTICS ARE USED IN LIVESTOCK

Legitimate needs (treating sick animals; disease prevention) have been blurred by non-therapeutic uses (e.g., historical growth promotion), which accelerate resistance.

SCALE AND TRENDS

Speaker cited estimates that ~70% of global antibiotic use occurs in animals. In the UAE, combined measures (vaccination campaigns, stricter prescription, oversight) contributed to a 23% reduction in veterinary antibiotic use (2019–2023).

POLICY MOMENTUM AND BANS

Growth-promoter use has been prohibited in multiple countries; the UAE banned growth-promoter antibiotics in 2024 and restricts specific human-critical drugs in animals.

AMR AS A SYSTEMS THREAT

Health impact
Rising treatment failures for previously routine infections.

Economic impact
Longer hospital stays and higher care costs.

Environmental spread
Residues and resistance genes can circulate through waste streams, soils, waters, aerosols, and trade—linking farms, food, and people.

HOW RESISTANCE EMERGES AND SPREADS

Bacteria adapt via mutations and plasmid-mediated gene transfer, moving between animals, humans, and the environment; food chains and cross-border trade amplify dissemination.

ALTERNATIVES & BEST PRACTICE PACKAGE

Vaccination programs; biosecurity and hygiene; rapid diagnostics; narrow-spectrum, targeted therapy; improved husbandry; probiotics/biologics where evidence supports; and strict withdrawal periods.

DRIVERS OF MISUSE

Over-prescription, using antibiotics for viral illnesses, incomplete treatment courses, prophylactic mass medication, broad-spectrum defaults, and treating without culture/susceptibility testing.

MEASUREMENT & SURVEILLANCE TOOLS

"Antibiotic footprint" concept to quantify national consumption.

WOAH (OIE) MUSE platform for standardized veterinary-use reporting.

UAE rollout of AMR/AMU monitoring and lab networks to inform targeted stewardship.

ONE HEALTH IN THE UAE

ADAFSA's Integrated Biosecurity System and One Health Community/Consortium (multi-agency) coordinate surveillance, legislation libraries, emergency lab networks, joint research, and public awareness (e.g., World AMR Awareness Week).

DAY 2

OPENING AND WELCOME ADRESS

H.E. Dr. Tareq Al•Ameri
Acting Director General
ADAFSA

The opening address set a visionary tone for the Agricultural Investment Forum, held under the patronage of H.H. Sheikh Mansour bin Zayed Al Nahyan, Vice President, Deputy Prime Minister, Minister of the Presidential Court, and Chairman of ADAFSA, as part of the Global Food Week celebrations in Abu Dhabi.

In his remarks, **H.E. Dr. Tareq Al-Ameri** warmly welcomed participants and highlighted the strategic importance of the forum as a gathering of policymakers, experts, and investors to **explore opportunities in the agricultural sector and advance the goals of food security and sustainable development.**

Dr. Al-Ameri emphasized that the organization of this forum aligns with Abu Dhabi's vision to **foster sustainable development, strengthen the food security ecosystem, and create an enabling environment for agricultural investment.** He described the event as **a strategic platform for knowledge exchange, best practice sharing, and future-oriented dialogue** on topics such as agricultural legislation, investment incentives, financing solutions, and the role of innovation and modern technologies including digital agriculture, artificial intelligence, and precision farming.

Reflecting on Abu Dhabi's recent progress, **Dr. Al-Ameri** noted that the emirate has witnessed a transformative leap in agricultural investments over the past few years. These include **smart farming, hydroponics, and cutting-edge food production projects, complemented by the expansion of major UAE agricultural companies into global markets.** ADAFSA, he stated, continues to work under an integrated strategy that enhances international trade, promotes sustainable domestic production, and supports agricultural enterprises both locally and abroad.

A key announcement during his speech was the launch of the new edition of the Abu Dhabi Agricultural Investment Guide, which features over 30 investment opportunities designed to attract private sector participation and accelerate sustainable growth. The guide encompasses opportunities in agricultural technologies, food processing, logistics, and research and development, as well as 145 approved farm-based economic activities in line with Abu Dhabi's investment framework.

Dr. Al-Ameri reaffirmed ADAFSA's commitment to empowering investors through facilitations, flexible policies, incentives, and technical support, in close coordination with the Abu Dhabi Investment Office and other government and financial entities.

In closing, he expressed his hope that the forum would mark a new chapter of fruitful and sustainable cooperation, strengthening Abu Dhabi's position as a global hub for agricultural excellence and food safety, while fulfilling the leadership's vision of a secure and sustainable food future.

The address concluded with appreciation for **Dr. Al-Ameri's** comprehensive outline of Abu Dhabi's roadmap for sustainable agricultural investment and his announcement of the new investment guide, which sets the foundation for innovation-led growth in the emirate's agri-food sector.

PRESENTATION

CEPA–UAE EXPORT OPPORTUNITIES

Ibtisam Alsaadi
Director of Policy and Legislation
MoIAT

The session provided a comprehensive overview of the UAE's Comprehensive Economic Partnership Agreements (CEPA) and their expanding role in driving export growth, particularly in the agri-food sector. The discussion centered on how these agreements are enabling the UAE to strengthen its position as a global production and re-export hub, open new markets, and reduce trade barriers for Emirati products.

Ibtisam Alsaadi explained that the main objective behind launching CEPA was to create investment and export opportunities for UAE-based industries while ensuring fair and transparent access to international markets. The agreements also address technical and regulatory challenges that often hinder exports, providing legal mechanisms to guarantee product recognition and market entry across partner countries.

Currently, the UAE has 13 agreements in force with countries including India, Turkey, Indonesia, Cambodia, Georgia, Australia, and New Zealand, among others. Several others—such as with Colombia, South Korea, Vietnam, Angola, and the Eurasian Economic Union—have been signed and await implementation. Active negotiations are underway with Japan, the European Union, and the Mercosur bloc, reflecting the country's continued focus on expanding its global export footprint.

A key advantage of CEPA is the reduction or elimination of customs tariffs. For example, 92% of UAE exports to Cambodia, 93% to Malaysia, and 100% to Australia and New Zealand now enter these markets duty-free. This preferential access boosts competitiveness and helps Emirati producers and manufacturers integrate more deeply into global value chains.

In the food and agricultural sectors, the agreements have yielded particularly strong results. Products such as cooking oils, juices, dairy items, and dates have gained greater access to multiple markets with reduced or zero tariffs. The UAE's success in exporting dates to India, including value-added forms like powders and syrups, was highlighted as a breakthrough example of how CEPA is supporting agri-food innovation and diversification.

The presentation also clarified the rules governing product origin and value addition. A minimum of 35% value-added content is required for manufactured exports, while raw agricultural goods must originate within the UAE. Transforming a product—such as turning milk into cheese or tomatoes into ketchup—qualifies it as a UAE-manufactured good under CEPA's origin rules, allowing exporters to claim tariff benefits.

Exporters are required to obtain a Certificate of Origin through the Ministry of Economy and Tourism's digital platform, which issues country-specific certificates for each CEPA partner. Most partner countries now accept electronic certificates with QR verification, simplifying customs clearance and improving traceability.

The presentation concluded with a call to utilize CEPA frameworks effectively, plan export strategies around new markets, and participate in national initiatives such as **"Make it in the Emirates."** These agreements, the speaker emphasized, are more than trade tools—they are instruments for building resilient, diversified, and globally competitive industries that contribute to the UAE's long-term economic sustainability.

The presentation offered a detailed insight into the agricultural and food investment ecosystem in Abu Dhabi, highlighting how KEZAD Group and AD Ports Group are enabling the emirate's vision of becoming a leading regional hub for food production, logistics, and trade integration.

The speaker began by emphasizing the importance of the session as a platform to showcase real investment opportunities in the food and agriculture sectors, complementing the CEPA trade agreements previously discussed—by explaining where and how investors can establish operations, manufacture, and export efficiently.

INTEGRATED INFRASTRUCTURE AND INDUSTRIAL ECOSYSTEM

KEZAD and AD Ports Group together manage a comprehensive portfolio of logistics, maritime, and industrial assets that support producers, manufacturers, and farmers in setting up and scaling operations in the UAE. The ecosystem includes:

Over 250 owned cargo vessels connecting UAE ports to global markets,

A robust logistics arm under Noatum, providing storage, freight, clearance, and export services

A vast network of economic and free zones offering plug-and-play facilities, ready-built warehouses, and streamlined digital business setup platforms.

Across 550 square kilometers of managed economic zones, there are more than 2,000 operating companies, including over 100 enterprises in the food and agriculture sectors. These zones are strategically distributed across Khalifa Industrial Zone (near Khalifa Port), Mussafah, and Al Ain, the latter being particularly suited for agri-tech projects due to its moderate climate and lower humidity.

SPECIALIZED CLUSTERS AND FACILITIES

The ecosystem supports a wide spectrum of agri-food industries, from dairy and poultry to beverages, bakery, starches, and emerging plant-based protein ventures. Existing and upcoming specialized clusters include:

- **AgriTech Technology Park in Al Ain –** a newly launched 250,000 m² complex designed for modern, high-yield, climate-controlled agriculture, supported by state-of-the-art infrastructure.
- **Abu Dhabi Global Food Hub –** a forthcoming integrated food market spanning over 3 km² between Abu Dhabi and Dubai. Strategically located near major ports and highways, this hub will serve as a centralized marketplace for fruits, vegetables, grains, meat, and poultry, providing dedicated retail and wholesale spaces for local farmers and traders. It will also act as a digital re-export platform, linking producers with government entities and export channels.

FACILITIES AND INVESTMENT INCENTIVES

KEZAD offers investors ready-to-operate facilities, including:

- **Over 800,000 m² of prebuilt industrial units.**
- **70,000 m² of cold storage capacity.**
- **Flexible distribution centers and retail warehouses.**
- **Light industrial units and business incubators for SMEs and startups.**
- **Fully serviced land plots with water, gas, and power connections already integrated.**

Investors benefit from custom-built project solutions, where KEZAD can finance and develop facilities on behalf of investors. The zones also feature worker accommodations, streamlined licensing, and extensive infrastructure connectivity.

COST ADVANTAGES AND INCENTIVES

To stimulate investment, KEZAD provides:

- **Flexible lease terms and grace periods.**
- **Up to 75% service fee exemptions for the food and agriculture sectors.**
- **Utility cost reimbursement programs in collaboration with the Abu Dhabi Investment Office (ADIO).**
- **Full customs and import duty exemptions for equipment and inputs used in production.**

These incentives make it easier for investors to establish cost-efficient, export-oriented operations aligned with the UAE's National Food Security Strategy.

GLOBAL CONNECTIVITY AND TRADE ENABLEMENT

One of KEZAD's key competitive advantages is its seamless connectivity—linking industrial and agricultural production zones to **Khalifa Port, Jebel Ali Port, and UAE airports**, as well as an expanding railway network that will further facilitate domestic and regional logistics. The infrastructure ensures smooth inbound flow of raw materials and rapid outbound export of finished goods to over 1,000 ports worldwide.

The presentation concluded with a preview of the **Abu Dhabi Food Hub**, envisioned as the country's central trading and logistics center for all food commodities. The hub will feature digital integration across government entities, ensuring transparency, traceability, and trade facilitation while supporting both local farmers and international traders.

This session focused on the growing importance of food security in the UAE and the strategic role of indoor farming as a sustainable and technology-driven solution to address the country's unique agricultural challenges. The discussion emphasized how rapid economic diversification, population growth, and climate limitations are driving the need for investment in advanced, localized food production systems.

ECONOMIC AND DEMOGRAPHIC CONTEXT

Over the past two decades, the UAE and other GCC countries have undergone significant economic transformation, diversifying away from hydrocarbons and attracting foreign investment. This has fueled rapid population growth, both through labor migration and higher domestic demand, which in turn has intensified pressure on food supply systems.

The speaker illustrated how rising national income has consistently correlated with increased food import dependency, especially for unprocessed agricultural commodities. With projections indicating that the UAE's population will surpass 11 million by 2025, and continue rising through 2050, food import demand is expected to grow proportionally — unless domestic production capabilities are expanded.

GEOGRAPHICAL AND CLIMATE CONSTRAINTS

The UAE faces profound geographical limitations: only 4.3% of its total land area is arable, with the vast majority being desert. Moreover, the country's strategic dependence on global shipping routes — such as the Strait of Hormuz, Bab el-Mandeb, and the Suez Canal — exposes it to geopolitical risks that can disrupt supply chains.

Adding to these challenges, global agricultural land availability has been declining since 2007 due to climate change, soil degradation, and extreme weather events. While initially higher temperatures slightly boosted yields in some regions, continued warming beyond 1.5°C is expected to reduce crop productivity and increase the frequency of droughts and floods. This underlines the urgency of developing resilient local food production models.

THE CASE FOR INDOOR AND CONTROLLED-ENVIRONMENT AGRICULTURE

Given the constraints of traditional open-field farming, localized food production through technology has become the UAE's most viable path toward sustainable food security.The speaker emphasized that indoor farming and advanced greenhouse systems—which rely on automation, robotics, and precise climate control—can overcome environmental barriers, optimize resource use, and enable year-round production.

However, achieving sustainability in these systems requires targeted research and development. Current technologies, particularly for cooling systems, are predominantly imported from Europe and North America—regions that focus more on heating than cooling. Dr. Sbaiti stressed the need for locally adapted innovations suited to the UAE's hot climate, calling for collaboration between academia, research centers, and industry to develop cooling-efficient solutions that reduce operational costs and carbon emissions.

MALTHUSIAN DYNAMICS AND THE GLOBAL FOOD PRESSURE

Referencing Thomas Malthus's theory, the speaker noted that when population growth outpaces food production, societies face rising risks of famine, disease, and conflict. The COVID-19 pandemic offered a glimpse of such vulnerabilities, with supply chain disruptions forcing the UAE to diversify sourcing and strengthen domestic capacity. This experience reinforced the importance of self-reliance and technological adaptation in ensuring food security.

INVESTMENT AND BUSINESS OPPORTUNITIES

The gap between domestic production capacity and growing food demand presents a clear investment opportunity. The UAE's strong government support—through initiatives by ADAFSA, Saal, and the Abu Dhabi Investment Office (ADIO)—has created an enabling environment for private sector participation in agri-tech and indoor farming ventures.

Dr. Sbaiti highlighted the importance of innovative business models built on public-private collaboration, where technology providers, local farmers, and research institutions form synergistic partnerships. Such cooperation can accelerate adoption of sustainable practices and drive returns for investors while enhancing food resilience.

The presentation concluded with a call to action: securing the UAE's food future requires localized agricultural innovation, sustained investment in research, and integration of technology with traditional farming knowledge. Indoor farming represents not just a technological shift, but a strategic national priority—a means of transforming the UAE's food system from import-dependent to innovation-led and self-sufficient.

FIRESIDE CHAT

TURNING WASTE INTO WEALTH

INVESTING IN TECHNOLOGY TO DIVERT AGRIFOOD WASTE FROM LANDFILLS

PANELISTS

Rabih El Chaar (Nadeera) | **Theophilus Alivezous** (Agthia)

Dr. Afkar Qasem (ADAFSA) | **Dr. Haitham** (Circa Biotech)

The discussion reframed food waste as a resource stream that can generate economic value while cutting emissions. Using Abu Dhabi's food-waste hierarchy (prevent → redistribute → upcycle → compost/energy → dispose) as the backbone, speakers highlighted policy levers, technology pilots, and business models that are already delivering measurable diversion—yet underscored that infrastructure, data, and cross-sector coordination must scale for impact.

CONTEXT & SCALE

- **Global food waste: 1.8 billion tonnes annually; ~$1T in losses; ~10% of global GHGs.**
- **Local approach: Apply the inverted pyramid to prevent first, then repurpose (freeze-dried snacks, animal feed, ingredients), and use compost/energy recovery only when edible uses aren't possible.**

WHAT'S WORKING NOW

POLICY & PREVENTION (ADAFSA)

- Distinction between **prevention/reduction (farm to kitchen) vs. waste management after disposal.**
- **Pilots with AI kitchen monitoring** (PPE compliance, cold-chain behavior) and telematics for chilled transport to extend shelf life and cut spoilage.
- **Farm-level collaboration** (e.g., pre-cooling/cold storage trials with Dutch partners) focused on feasible tech for SMEs.

MANUFACTURER ACTIONS (AGTHIA)

- **Group-wide waste mapping platform** quantifying tonnage, materials, and cost; triggers P&L-aligned actions.
- **Upcycling synergies across categories** (e.g., date seeds/fiber as inputs elsewhere).
- **Partnerships with universities and startups**, and corporate VC to de-risk pilots.
- **Field pilots with 24k date farmers using sensors** to raise yields and reduce losses.

BIOCONVERSION AT SCALE (CIRCA BIOTECH)

- **Black soldier fly** facilities processing **6,000 t/year** pre-consumer food waste; plan to scale to **168,000 t/year.**
- **Outputs:** animal-feed protein, organic fertilizer, and pathways to sustainable aviation fuel.
- **Unit economics:** ~$600 revenue/ton converted; ~35% gross margin; core need is scale financing.
- **Retail partnerships** (e.g., supermarkets) have achieved >65% diversion of pre-consumer waste in 6 months.

ENABLERS & GAPS

- **Infrastructure**: Source segregation systems, composting/biogas capacity, and reliable collection logistics are prerequisites to valorization.
- **Data:** A unified baseline and reporting (e.g., via ne'ma/EAD initiatives) to target hotspots and match streams to solutions.
- **Regulation & incentives**
  - Clarify roles (ADAFSA prevention; EAD waste management).
  - Consider **"pay-as-you-throw"** and diversion incentives; **harmonize rules across emirates with a one-stop regulatory shop** for circular projects.
- **Collaboration:** Public–private partnerships linking policy, large producers, startups, and financiers to move pilots to city-scale.

Abu Dhabi can halve food waste by 2030 if it scales what already works: measure waste, prevent it upstream, valorize sorted streams via upcycling and bioconversion, and back it with coherent policy, infrastructure, and finance. The economic case is real; the next step is integration and scale.

FIRESIDE CHAT

INNOVATION & TECHNOLOGY IN SUSTAINABLE AGRICULTURE

DIGITAL FARMING, AI, AND PRECISION AG

Rabih El Chaar
NADEERA

The session argued that technology is no longer a "nice to have" but the shock absorber for food systems facing climate volatility and geopolitical supply risks—especially in grains, which make up roughly half of global caloric intake. A multi-country analysis showed that targeted ag-tech investment directly correlates with productivity, resource efficiency, and cost stability.

THREE ROLES WHERE TECH MOVES THE NEEDLE

1. **Yield & quality: Biotechnology and advanced crop inputs can lift output ~12–20%, strengthen pest control (≈21% improvement cited), and tailor product traits.**
2. **Prediction & precision: Digital twins, remote sensing, and AI prescribe when/where to irrigate, fertilize, or spray, cutting losses and variability.**
3. **Operational efficiency: Automation, robotics, and decision tools lower unit costs and stabilize margins across seasons.**

WHAT THE 25-COUNTRY MODEL FOUND

- Countries were clustered into frontier / developing / emerging cohorts based on five high-impact drivers (land, labor, water, climate exposure, and tech readiness/uptake).
- There is a one-to-one link between investment intensity in ag-tech and national production efficiency—i.e., the more coherent the tech deployment, the higher the resilience and output per resource unit.

FRONTIER OUTCOMES ALREADY OBSERVABLE

- Labor dependence: down ~64% via automation and guided operations.
- Land intensity: output per hectare up, implying ~52% less land needed for an equivalent basket.
- Water use: savings of ~25% for comparable yields through precision irrigation and scheduling.

TECHNOLOGY STACK IN SCOPE

- Biotech & crop protection (stress tolerance, targeted IPM).
- Digital/AI (satellite + IoT sensing, variable-rate applications, agronomic decision engines).
- Mechanization & robotics (autonomous spraying/harvest, sensor-guided implements).
- Chemistry & formulations (next-gen inputs aligned with precision programs).

FROM THEORY TO DEPLOYMENT

The work moves beyond "tech will help" to country-specific value-chain roadmaps (e.g., grains): identify which technologies are available now, where they sit in the chain (on-farm, logistics, storage), and what to finance first for the fastest efficiency lift.

RELEVANCE TO THE GCC/UAE

- With heat and water constraints—and import exposure—precision, digital, and controlled-environment plays can deliver rapid resilience.
- Success requires enablers in parallel: data infrastructure, farmer onboarding, financing mechanisms, and aligned policy—so investment doesn't stall at pilot scale.

Technology is the practical hedge against shocks: invest with intent (stacked tools, not point fixes), measure outcomes, and pair deployment with policy and finance. Done right, countries can produce more with less—less labor, land, and water—while stabilizing grain supply under a changing climate.

FIRESIDE CHAT

FINANCING AGRICULTURAL PROJECTS

THE ROLE OF BANKS

SPEAKER | **Shaker Farid Abdulrahman Zanil** (Emirates Development Bank)

GUESTS | **Dr. Ahmed Mokhtar** (FAO), **Hassan Hallawi** (Elite Agro)

This discussion explored how financial systems can become enablers rather than barriers for farmers and agri-entrepreneurs. With agricultural loans in the UAE representing less than 1% of total national lending, the session highlighted why innovative financial instruments, risk mitigation tools, and institutional collaboration are vital to turning the UAE's agricultural sector into a competitive, bankable, and sustainable industry.

GLOBAL CONTEXT AND FAO PERSPECTIVE

Dr. Ahmed Mokhtar (FAO) opened with a global overview of agricultural finance, noting that in most regions, including the GCC, small farmers lack effective access to tailored financial products. While capital may exist in national banking systems, it often fails to reach producers due to high interest rates, rigid requirements, and limited understanding of agricultural cycles.

He emphasized that agricultural finance is fundamental to food security, supporting technology adoption, climate adaptation, and modern production systems. Access to affordable credit, he said, can raise productivity significantly and help farmers build resilience to economic and climatic shocks.

PRIVATE SECTOR AND RISK NEUTRALIZATION

Hassan Hallawi, CEO of Elite Agro, spoke candidly about the structural barriers deterring both investors and farmers:

- High interest rates make it nearly impossible for smallholders to sustain loans when agricultural ROI is long-term and cyclical.
- Agriculture remains one of the riskiest businesses, exposed to climate, pests, and volatile markets, which makes commercial banks hesitant to lend.

He argued for a shared-responsibility model—a partnership among government, banks, and the private sector to spread risk and make lending viable. Drawing from global best practices, he proposed two mechanisms:

AGRICULTURAL GUARANTEE FUND

- A sovereign-backed guarantee that shares investment risk between the farmer, the government, and the bank.

  Example: Morocco's "Tamwil Falah" program, where a guarantee fund contributes up to 30% of project costs, the farmer contributes 20%, and banks finance the rest. This balance reduces perceived risk and encourages lending.

AGRICULTURAL INSURANCE SCHEME:

- Introducing a national crop insurance framework to protect farmers from weather or pest-related losses.
- When insurance absorbs part of the risk, banks can offer lower interest rates and expand credit lines.
- Without these tools, Hallawi said, small UAE farmers cannot compete with neighboring countries where labor and production costs are a fraction of domestic levels.

INNOVATIVE FINANCING MODELS (FAO FRAMEWORK)

Dr. Mokhtar further described FAO's Transformative Partnership Model, which rests on three pillars:

CAPITAL MOBILIZATION: pooling resources from public and private investors to fund agricultural modernization.

RISK SHARING AND BLENDED FINANCE: aligning risk among banks, government entities, and producers to enable access for high-risk borrowers.

VALUE CHAIN DEVELOPMENT: linking finance with technical assistance and market access to ensure long-term sustainability.

He also referenced regional instruments such as the Arab Agricultural Development Fund and new FAO-led initiatives integrating digital and Islamic finance tools to reach smallholders. Financing mechanisms must be customized by country, he noted, based on local institutions, crop patterns, and risk profiles.

ALIGNING NATIONAL POLICY AND PROCUREMENT

Hallawi concluded with a pragmatic proposal for local market absorption of domestic produce. He suggested transforming successful pilots like ADNOC's "Sea Berry" project into a national procurement framework, where large government and corporate buyers (e.g., the military, police, or ADNOC catering) source a portion of their food needs from local farmers at fair, stable prices.

This model would:

- Create a domestic demand anchor for small producers.
- Prevent market gluts and price crashes during peak harvests.
- Encourage crop diversification through coordinated planting calendars linked to institutional buyers.

KEY TAKEAWAYS AND RECOMMENDATIONS

The moderator summarized five critical action points emerging from the dialogue:

1. **Expand Agricultural Finance Instruments – Introduce guarantee and insurance schemes that de-risk lending.**
2. **Institutionalize Tri-sector Partnerships – Foster collaboration among public, private, and financial institutions.**
3. **Farmer Empowerment and Financial Literacy – Build awareness and capacity for managing credit and risk.**
4. **National Agricultural Project Database – Create an integrated platform to map financing needs and opportunities.**
5. **Digitize Agri-finance – Leverage fintech and blockchain tools for transparency, inclusion, and speed.**

The session reframed agricultural finance as a cornerstone of national food security—not a niche credit category. By adopting risk-sharing funds, crop insurance, and guaranteed procurement mechanisms, the UAE can unlock the true potential of its 50,000 farmers, shifting agriculture from a subsidized sector to a profitable, investment-worthy pillar of economic diversification.

SUCCESS STORIES IN AGRICULTURAL INVESTMENT
LOCAL AND INTERNATIONAL CASES

SPEAKERS

Abdulrahman Rashid Al Shamsi, Founder, Swing Fish Integrated Farm

Fadel Nasser Al Saadi, Emirati Beekeeper and Founder, Al Saadi Honey Farm

Dr. Hamad Saif Muaddad Al-Mashghouni, Founder, Eliz Poultry Farm

The session featured inspiring stories of Emirati entrepreneurs who have turned their agricultural ambitions into thriving, sustainable ventures.

These success stories demonstrate how the UAE's supportive ecosystem-anchored in innovation, sustainability, and food security-empowers local investors and farmers to build resilient agribusiness models that compete globally.

Each case reflected a unique dimension of agricultural progress integrated farming and water reuse, advanced apiculture, and technologically driven poultry production.

Together, they painted a portrait of UAE's agricultural transformation where innovation meets tradition to ensure long-term food security and sustainability.

SWING FISH INTEGRATED FARM

Abdulrahman Al Shamsi

Abdulrahman Al Shamsi shared the remarkable journey of Swing Fish Farm, established in 2003, as a model of integrated, circular agriculture in the UAE. Guided by the words of the late Sheikh Zayed bin Sultan Al Nahyan "Give me agriculture, and I guarantee you civilization" Al Shamsi has built a self-sustaining farm that combines aquaculture, livestock, crops, and renewable water systems into one efficient ecosystem.

The farm's circular design ensures that no resource is wasted

- Water from fish ponds is reused to cultivate azolla, a protein-rich aquatic plant that serves as organic feed for fish, poultry, and livestock.
- Nutrient-rich water is then recycled for open-field crops and fodder production.
- By optimizing irrigation systems, water efficiency increased exponentially—one minute of irrigation equals 48 minutes of traditional watering, achieving almost 48x water-use efficiency.

The farm operates successfully using brackish water (8,000–10,000 ppm) for fish, date palms, and fodder. Al Shamsi also introduced on-site microbial activation, reducing dependency on costly chemical inputs, cutting monthly costs from AED 60,000 to AED 1,500 while improving soil and water quality.

KEY ACHIEVEMENTS

Best Integrated Farm, Abu Dhabi (2022) and Sheikh Mansour bin Zayed Award for Best Aquaculture Farm.

Open-field yields of more than 110 tonnes of zucchini and lettuce annually.

Development of an Indonesian chicken line produced sustainably and sold at affordable prices.

Al Shamsi emphasized his commitment to training and mentoring young Emirati farmers, offering free access to farm blueprints, azolla cultures, and sustainable farming techniques.

His philosophy

Every drop of water holds value—when managed wisely, it creates prosperity.

AL SAADI HONEY FARM

Fadel Nasser Al Saadi

Fadel Al Saadi's journey in beekeeping began in 2000 as a personal passion and grew into one of the UAE's leading apiculture enterprises. His farm has played a pivotal role in transforming the perception of beekeeping from a small-scale hobby into a scientifically managed and commercially successful industry.

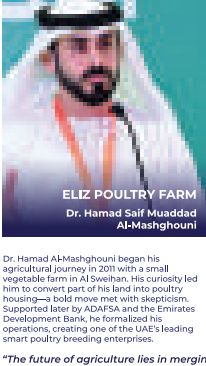
Through collaboration with the Abu Dhabi Agriculture and Food Safety Authority (ADAFSA) and the Al Kuwaitat Honey Research Station, Al Saadi helped develop the first Emirati bee strain—a resilient hybrid adapted to the country's climate, capable of high productivity and resistance to disease.

With a focus on research, quality, and diversification, Al Saadi expanded from 50 kilograms of annual production to 18 tonnes of high-grade honey and value-added derivatives such as royal jelly, bee pollen, and bee bread. He also launched child-friendly creamy honey, blending nutrition with innovation.

KEY ACHIEVEMENTS

- **Winner of the Sheikh Mansour bin Zayed Award for Best Beekeeper in the UAE.**
- **Recipient of two gold medals at the London International Honey Competition (2025).**
- **Exporting Emirati honey products that meet international standards for purity and quality.**

Al Saadi's story underscores how research partnerships, national leadership support, and branding excellence can elevate local products to global markets. He closed by noting: ***"Every hive is a small ecosystem—when cared for with science and patience, it becomes a symbol of our national pride."***



ELIZ POULTRY FARM

Dr. Hamad Saif Muaddad Al-Mashghouni

Dr. Hamad Al-Mashghouni began his agricultural journey in 2011 with a small vegetable farm in Al Sweihan. His curiosity led him to convert part of his land into poultry housing—a bold move met with skepticism. Supported later by ADAFSA and the Emirates Development Bank, he formalized his operations, creating one of the UAE's leading smart poultry breeding enterprises.

His first major step came in 2017 with the creation of a hatchery project, developed for around AED 168,000. During the COVID-19 pandemic, supply disruptions in imported hatching eggs inspired him to launch a "Mothers" breeder program, focused on local egg production to ensure the UAE's poultry independence.

Milestones

- **Expansion from 15,000 to 90,000 breeders across 10 facilities.**
- **Investment growth from AED 168,000 to AED 11 million within four years.**
- **Partnership with Emirates Development Bank for structured agricultural financing.**
- **Upcoming AI-driven management system integrating sensors, image recognition, and data analytics to monitor poultry health, feed, and productivity in real time.**

Al-Mashghouni's collaboration with companies from Canada, the U.S., and China will enable predictive poultry health systems and automated feeding and environmental adjustments. He aims to position the UAE as a regional leader in intelligent poultry farming and called for support to establish grandparent breeding farms, essential for achieving national self-sufficiency in poultry genetics.

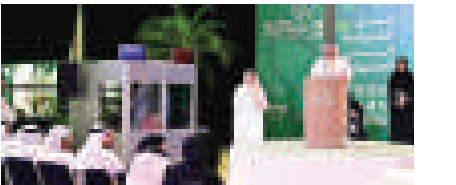
"The future of agriculture lies in merging innovation with courage—and believing that small farms can lead great revolutions."

KEY TAKEAWAYS

- **Integration and Circular Systems:** Resource recycling and on-farm innovation drive profitability and resilience.
- **Science and R&D:** Local research and adaptation are key to overcoming climatic challenges.
- **Access to Finance:** Structured formalization and collaboration with banks make scaling possible.
- **Technology and AI:** Smart tools improve precision, efficiency, and sustainability.
- **Knowledge Sharing:** Empowering youth and sharing expertise accelerate sector-wide progress.

This panel captured the UAE's agricultural transformation from the ground up—led by visionary farmers who combine tradition, innovation, and sustainability. Each story reflected a shared belief in self-reliance, ecological stewardship, and the UAE's commitment to global food security.

These entrepreneurs are not only cultivating crops, bees, and birds—they are cultivating a national model for sustainable agriculture, proving that with innovation and determination, even the harshest deserts can yield prosperity.



ADAFSA AWARDING CEREMONY

The Abu Dhabi Agriculture and Food Safety Authority (ADAFSA) held a special Awarding Ceremony during Global Food Week 2025, celebrating public-private collaboration toward building a more sustainable, safe, and efficient food system.

Guided by the vision of the UAE's wise leadership, the event underscored Abu Dhabi's commitment to responsible consumption, technological innovation, and sustainability in food management.

This ceremony recognized leading food establishments and partners who played a pivotal role in reducing food loss and waste, advancing smart inspection systems, and enhancing food safety practices across the emirate.

Event Hosted by

ABU DHABI AGRICULTURE AND FOOD SAFETY AUTHORITY

In partnership with

EMIRATES FOUNDATION

neʼma

OPENING REMARKS

The session opened with a warm welcome to attendees, emphasizing that Global Food Week represents Abu Dhabi's ambitious vision for a sustainable and responsible food system. ADAFSA's ongoing mission—"to safeguard food safety and promote responsible consumption"—was highlighted through three key initiatives:

1. **Food Loss and Waste Reduction Strategy, in partnership with the National initiative, ne'ma.**
2. **Visual Food Control Project, powered by artificial intelligence.**
3. **Golden Food Product List Initiative, streamlining trade and inspection for trusted food producers.**

Her Excellency Khuloud Al Nowais, Chief Sustainability Officer at Emirates Foundation and Secretary-General of the ne'ma Initiative, joined His Excellency Basil Al Jabri, Executive Director of the Inspection and Control Sector at ADAFSA, to present awards to the recognized partners and establishments.

VOLUNTARY IMPLEMENTATION INITIATIVE AWARDS

This initiative, part of the Abu Dhabi Food Loss and Waste Reduction Strategy, honors establishments that voluntarily implemented responsible food waste management practices in their daily operations.

AWARDED ESTABLISHMENTS INCLUDED



These entities were celebrated for their social responsibility, data transparency, and operational innovation, particularly during the Ramadan 2024 Pilot Program, which helped establish the framework for the upcoming National Food Loss and Waste Measurement Project.

ne'ma INITIATIVE PARTNERSHIP RECOGNITION

ADAFSA and ne'ma jointly acknowledged a wide range of hospitality and foodservice partners who shared vital data through the ne'ma platform, contributing to evidence-based solutions for waste reduction.

Participants Included:

Al Ain Rotana Hotel, Al Diyar Dana Hotel, Al Maha Arjaan, Aldar Hospitality, Beach Rotana, Centro Al Manhal, Conrad Abu Dhabi Etihad Towers, Crown Plaza Yas Island, Four Seasons Abu Dhabi, Hala Arjaan, Hilton Abu Dhabi Yas Island, Majlis Grand Mercure, Marriott Downtown, National Corporation for Tourism & Hotels, Pearl Rotana, Shangri-La Hotel, Traders Hotel, W Abu Dhabi, Yas Plaza Hotel, and many others.

These partners demonstrated how collective action between government, private sector, and civil society can reduce waste, improve data-driven monitoring, and build a culture of sustainability across Abu Dhabi's food ecosystem.

VISUAL FOOD CONTROL PROJECT AWARDS

The ceremony also recognized establishments participating in ADAFSA's Visual Food Control Project, a pioneering initiative that leverages AI algorithms, smart cameras, and IoT systems to monitor and ensure food safety practices in real time.

This digital innovation enhances inspection efficiency, ensures compliance with hygiene standards, and allows remote oversight—enabling faster intervention, better training, and higher food quality.

Honored Participants Included

Calicut Notebook, Gazebo Restaurant, Belgian Café (Novotel Gate Hotel), Café Shameem, Lulu Express Fresh Market, Galleria Café, Mital Walla Restaurant, and others.

Their active participation in this AI-powered system contributed to creating data-rich, traceable, and sustainable inspection processes, positioning Abu Dhabi as a global leader in digital food safety governance.

GOLDEN FOOD PRODUCT LIST INITIATIVE

To conclude, ADAFSA spotlighted the Golden Food Product List Initiative, which aims to facilitate trade flow, support trusted food manufacturers, and maintain the highest safety standards.

This program accelerates customs clearance for food products with a strong safety record across UAE border points, aligning with Abu Dhabi's economic competitiveness strategy.

Recognized Companies Included

Masna' Al Wafi Mana, Sharikat Abu Dhabi Nabatea, Enjoy, Food ATM, among others.

This initiative bridges public safety assurance with private sector efficiency, reinforcing Abu Dhabi's vision of becoming a global hub for safe, sustainable, and innovative food trade.

Closing Remarks

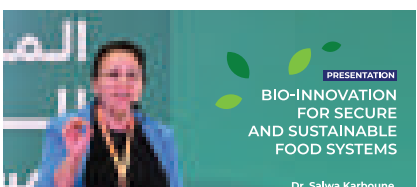
The ceremony concluded with an expression of deep gratitude to all honorees for their collaboration and excellence.








ADAFSA reaffirmed its commitment to advancing food safety, sustainability, and digital transformation—working hand in hand with the private sector to make Abu Dhabi a model for responsible food systems worldwide.



In a compelling and forward-looking session, Dr. Salwa Karboune from McGill University's McDonald Campus explored how bio-innovation and biocatalytic technologies can drive the transformation toward secure, sustainable, and health-focused food systems. Drawing on her extensive research in food science, she highlighted how nature-inspired innovation, predictive modeling, and circular processes can reshape global agri-food ecosystems.

Her talk connected scientific innovation with real-world applications, showing how agricultural byproducts, natural compounds, and biodiversity can be converted into functional ingredients that benefit both human health and the planet.

MCGILL'S APPROACH TO FOOD SECURITY AND ONE HEALTH

The speaker introduced McGill University's Faculty of Agricultural and Environmental Sciences as a center of excellence focused on tackling environmental, nutritional, and health challenges. The faculty follows the One Health philosophy, which links human, animal, and environmental health within one interconnected framework.

Research priorities span food safety, nutritional diversity, sustainable production, and bio-innovation. She emphasized that true food security must be rooted not only in quantity but also in quality—feeding people nutritiously, safely, and sustainably.

THE SHIFT TOWARD NUTRITIONAL SUSTAINABILITY

The presentation emphasized the growing need to transition from the idea of food sustainability to nutritional sustainability.

This broader perspective ensures that, along with sustainable production, the nutrient density and diversity of food are preserved throughout the value chain.

Sustainable food systems, she explained, must combine ethical sourcing, circular production, efficient use of resources, and transparency. Today's consumers are increasingly seeking clean, healthy, and traceable foods, pushing industries to innovate responsibly and deliver value without compromising environmental or social integrity.

LEARNING FROM NATURE: PREDICTING AND MODULATING FOOD BEHAVIOR

A key message was the importance of learning from nature–not just replicating it, but understanding, predicting, and optimizing its systems.
The speaker presented McGil's multidimensional ingredient innovation platform, an open-access database of over 5,400 natural ingredients.

This platform helps researchers and food manufacturers identify optimal ingredient combinations based on sustainability, functionality, and synergistic potential. By analyzing how natural compounds interact, it supports the design of clean-label products with improved texture, taste, and nutritional benefits.

EXPLORING BIODIVERSITY AND THE "DARK MATTER" OF FOOD

The session introduced the concept of the "dark matter of food"—the unexplored biochemical diversity in natural ingredients that remains largely unknown to science. Through advanced chemical profiling, her team studied essential oils and plant extracts to understand their composition and interactions.

They discovered that combinations of essential oils and plant polyphenols, such as catechin and quercetin, delivered far stronger antioxidant effects than individual compounds. These findings reveal how biodiversity offers natural synergies that can replace synthetic additives. Predictive modeling tools developed in her lab are now being used to identify and apply these synergies in new food formulations.

CIRCULAR INNOVATION IN CHOCOLATE MANUFACTURING

As a case study, the presentation showcased a project with a chocolate manufacturer where cocoa bean shells, usually treated as waste, were transformed into high-value food ingredients. Her team extracted phenolic compounds and dietary fibers, then combined them using biocatalytic processes to create ferulated carbohydrates with antioxidant and prebiotic properties.

When these new ingredients were added back into chocolate formulations, they enhanced both flavor and nutritional quality while maintaining strong consumer acceptance. This example illustrated a successful circular food innovation, where byproducts become valuable resources, aligning economic, environmental, and sensory goals.

TRANSFORMING MAPLE SYRUP INTO FUNCTIONAL PREBIOTICS

Another example from her research demonstrated how sucrose from maple syrup was enzymatically converted into prebiotic oligosaccharides. These compounds were found to promote beneficial gut bacteria and improve metabolic health.

In animal studies, the prebiotics increased the abundance of Akkermansia muciniphila, a microbe linked to improved metabolism and reduced fat accumulation. This project showed how biocatalytic innovation can transform a common natural product into a functional health-promoting ingredient, contributing to nutritional well-being.

The speaker concluded that the future of food security depends on integrating science, sustainability, and biodiversity. Nature-inspired innovation, predictive modeling, and circular production can together build food systems that are nutritious, resilient, and environmentally sound.

She emphasized that nutritional sustainability must be at the heart of food strategies and that collaboration among scientists, policymakers, and industry is vital to realizing this goal. As she remarked, "The biodiversity within our food is a treasure of solutions. If we can learn from nature—predict, modulate, and innovate—we can build a food system that is both secure and sustainable."

The session offered a clear vision for the future of agri-food systems—one driven by scientific excellence, sustainability, and cross-sector collaboration. It demonstrated how bio-innovation can transform the way we produce and consume food, ensuring that sustainability and health go hand in hand.

DAY 3

OPENING REMARKS

H.E. Ahmed Khaled Abdo

Deputy Director General (Acting)
Abu Dhabi Agriculture and
Food Safety Authority (ADAFSA)

His Excellency Ahmed Khaled Abdo opened the session by welcoming participants to the Agricultural Scientific Research Day, organized by ADAFSA in collaboration with the United Arab Emirates University as part of Global Food Week 2025.

He emphasized that this annual research event serves as a scientific milestone for Abu Dhabi's agricultural and food sectors, reflecting the emirate's ongoing efforts to strengthen food security and sustainability. The event highlights the outcomes of applied research conducted by ADAFSA's research teams across its various experimental stations, in partnership with universities and international research centers. These efforts aim to translate scientific knowledge into practical solutions that directly support farmers and stakeholders in the agricultural and food industries.

His Excellency also extended a warm welcome to the international keynote speakers hosted by UAE University, whose participation enriches the event with insights into global innovation and sustainable technologies—reinforcing the link between research excellence and on-ground application.

In his address, he affirmed ADAFSA's firm belief that innovation and knowledge are the true path to sustainability, and that investment in scientific research is an investment in the nation's food-secure future. He concluded by expressing his gratitude to all participants for their contributions to the success of this initiative, and his hope that the forum would serve as a collaborative platform to advance smarter agriculture and safer food for future generations.

PRESENTATION

ROLE OF SUSTAINABLE LIVESTOCK PRODUCTION TOWARDS FOOD SECURITY IN ARID REGIONS

Dr. Juan Loor
Professor
University of Illinois Urbana Champaign

Dr. Juan Loor delivered an insightful presentation on how sustainable livestock production can support food security in arid regions, emphasizing the importance of understanding the biological and nutritional responses of animals to climate challenges such as heat stress. As an animal scientist specializing in dairy cattle, he shared research findings and strategies aimed at ensuring animal productivity and health under increasingly harsh environmental conditions.

UNDERSTANDING THE CHALLENGE: CLIMATE STRESS AND FOOD SECURITY

The speaker began by recognizing the dual pressures facing global livestock production—competition for feed resources and the impacts of climate change. He highlighted that in arid regions like the Middle East, North Africa, and parts of West Africa, heat stress is one of the most critical challenges to sustainable livestock production.

Drawing parallels to arid regions of the United States, such as Arizona, Dr. Loor noted that despite the harsh climate, large-scale dairy farming has succeeded through science-driven management and adaptive nutrition. These examples underscore that sustainability in livestock farming requires a deep understanding of how animals physiologically respond to heat and environmental stress, enabling farmers to adapt management and feeding systems effectively.

THE SCIENCE BEHIND HEAT STRESS AND ANIMAL PERFORMANCE

Dr. Loor explained that when livestock, particularly dairy cows, experience heat stress, their feed intake drops as the animals divert energy toward cooling mechanisms. This leads to lower milk yield and nutrient efficiency, while also triggering immune activation that consumes nutrients otherwise used for production.

He emphasized that one of the main physiological concerns under heat stress is gut permeability—especially in ruminants, where microbial fermentation occurs in the rumen. Heat stress can weaken the gut barrier, allowing harmful bioactive molecules to enter circulation and divert energy from growth and milk synthesis toward immune defense.

Understanding and mitigating this response through nutrition is key to maintaining animal health and productivity.

NUTRITIONAL INTERVENTIONS AND MICRONUTRIENT STRATEGIES

Dr. Loor shared several experimental findings that demonstrate how targeted nutritional strategies can counteract heat-induced oxidative stress in livestock.

One of the highlighted studies explored the role of selenium, a micronutrient essential for antioxidant defense. When supplied as selenium methionine—a bioavailable organic form—rather than as inorganic selenium salts, the nutrient's absorption and utilization significantly improved. The enhanced selenium status led to increased antioxidant enzyme activity, reduced oxidative damage, and improved liver function in dairy cows subjected to controlled heat stress conditions.

He pointed out that the goal of such interventions is not necessarily to boost milk production during heat stress, but to maintain animal health and stable productivity, thereby improving overall sustainability.

THE ROLE OF AMINO ACIDS IN STRESS ADAPTATION

Beyond micronutrients, the speaker discussed the role of amino acids—especially methionine, an essential amino acid with both production and health functions. In addition to supporting milk protein synthesis, methionine contributes to the formation of glutathione and taurine, two key antioxidants that protect against cellular stress.

Experiments conducted in Illinois, Brazil, and Southeast Asia demonstrated that supplementing dairy cows with rumen-protected methionine not only improved milk protein yield but also helped preserve the integrity of the rumen's epithelial lining under heat stress conditions. This finding suggests that methionine plays a dual role: improving productivity while enhancing resilience.

INNOVATIVE FEED RESOURCES FOR SUSTAINABLE NUTRITION

Moving beyond conventional feed strategies, Dr. Loor explored the potential of alternative and green feed sources such as insect-based protein meals, agri-industrial byproducts, and microalgae.

He noted that these resources can provide high-quality protein, beneficial fatty acids, and bioactive compounds like polyphenols, which may help livestock better cope with stress and inflammation. For example, microalgae not only supply essential nutrients but also possess anti-methanogenic properties, helping to reduce greenhouse gas emissions—a key sustainability goal.

By studying the biochemical pathways these compounds influence, particularly through fields like nutrigenomics and phenomics, scientists can better predict how specific nutrients and feed components affect animal physiology, stress response, and productivity.

RESEARCH, TECHNOLOGY, AND THE WAY FORWARD

Dr. Loor underscored that the path to sustainable livestock systems in arid regions lies in combining scientific research, precision nutrition, and modern technology. Tools such as heat chambers and bioinformatics are already allowing researchers to model animal responses and develop data-driven feeding strategies.

He stressed that sustainability is not about maximizing production at all costs but about balancing productivity, animal welfare, and environmental stewardship. Integrating nutritional science with genetic and technological innovation will be central to building climate-resilient livestock systems.

In closing, Dr. Loor reaffirmed that green nutrition strategies—those that optimize animal health, minimize environmental impact, and make use of locally available resources—are essential for achieving sustainable livestock production in arid climates. He called for greater collaboration between scientists, farmers, and policymakers to apply these insights in practice and strengthen global food security.

His presentation left a strong message: ***sustainability begins with understanding the animal—and empowering that understanding through science and innovation.***

PRESENTATION

HONEYBEE DISEASES AND PESTS

DIAGNOSIS, PREVENTION, AND TREATMENT

Saad Masri
Expert, Abu Dhabi Agriculture and Food Safety Authority (ADAFSA)

The session provided an in-depth look at the major diseases and pests affecting honeybees in the UAE, along with practical guidance on diagnosis, prevention, and treatment. With decades of experience in apiculture, the speaker highlighted the growing challenges honeybees face under the country's extreme climatic conditions—particularly heat stress during summer, which weakens colonies and heightens vulnerability to infections and parasites.

Honeybees, he emphasized, play an essential role in sustaining agriculture and biodiversity, contributing to the pollination of more than 75% of global crops. Their health directly influences agricultural output and food security, making effective management of bee diseases vital to both environmental and economic sustainability.

The discussion covered the full range of bacterial, fungal, and parasitic threats, focusing on the most prevalent and damaging ones in the UAE.

Among bacterial diseases, American Foulbrood (AFB) emerged as the most destructive. Once detected, the only remedy is to destroy infected colonies, as antibiotics are prohibited due to honey contamination risks. European Foulbrood (EFB), while less severe, can be managed through requeening, stress reduction, and short-term antibacterial treatment when permitted.

Fungal diseases such as chalkbrood can be addressed by moving hives to sunnier, drier areas, increasing colony strength, and introducing younger queens. More serious is Nosema disease (Nosema apis and Nosema ceranae), described as a "silent killer" of colonies. It attacks the bees' midgut, leading to paralysis and rapid colony collapse—often within 24 hours. Outbreaks typically occur in early spring and autumn after honey extraction, when immunity levels drop. Preventive care is critical, and natural treatments like diluted honey vinegar with lemon can cleanse the bees' digestive system without affecting honey quality.

Attention then turned to wax moth infestations, a recurring issue in apiaries with poor hygiene. The moths target pollen-rich combs and can devastate unmaintained hives. Prevention depends largely on cleanliness, proper storage of frames in cool areas, and wax recycling. The economic

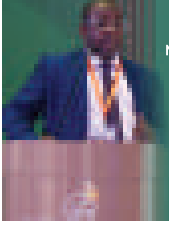
importance of wax recycling was also underscored—producing one kilogram of wax requires eight kilograms of honey, making wax more valuable than many realize.

The Varroa mite (Varroa destructor) remains the most dangerous pest, capable of destroying an entire hive within weeks if left unchecked. Mites reproduce inside brood cells and feed on bee fat bodies, weakening immunity and spreading viruses. Regular weekly inspections are vital, and if more than five mites per frame are found, immediate intervention is needed. Under UAE conditions, ADAFSA's research identified Apivar (amitraz) as the most effective treatment, while thymol-based natural extracts may also be used cautiously to avoid behavioral changes in bees. Nutritional support—especially protein feeding during summer—helps bees build fat reserves that improve both heat tolerance and mite resistance.

The presentation also emphasized the importance of hygiene, queen management, and continuous observation in disease prevention. Beekeepers were advised to keep equipment clean, monitor colony behavior, and send samples for laboratory testing when abnormalities arise.

In conclusion, the speaker noted that beekeeping in the UAE remains strong and adaptive. Most beekeepers import bees twice yearly (in February–March and October), maintaining the production of multifloral, summer, and mangrove honeys. Around 10% of beekeepers report significant losses each year, primarily due to Nosema and Varroa, but these remain within manageable limits for the country's estimated one million hives.

The session closed with a message of optimism: sustainable apiculture in the UAE depends on continuous monitoring, natural treatments, proper nutrition, and hygienic practices. ***Through collaborative efforts and ongoing ADAFSA initiatives, the sector is increasingly capable of safeguarding bee health and supporting the nation's broader goals*** of food security and environmental sustainability.



PRESENTATION

USING ADVANCED MOLECULAR TECHNIQUES TO PINPOINT WESSELSBRON VIRUS AS AN EMERGING PATHOGEN DURING THE INVESTIGATION OF UNKNOWN CAMEL MORTALITY IN ETHIOPIA

Tijani Ahmad
Expert, ADAFSA
(on behalf of Dr. Hassan Ishag)

The session focused on the use of advanced molecular diagnostics to identify the Wesselsbron virus (WSLV) as an emerging pathogen during the investigation of mysterious camel deaths in Ethiopia. Representing the ADAFSA Biosecurity Affairs Division, the speaker highlighted the pioneering role of the WOAH Collaborating Centre for Camel Diseases, hosted by ADAFSA in Abu Dhabi, in leading this investigation.

The Collaborating Centre, designated by the World Organisation for Animal Health (WOAH) in May 2022, serves as an international hub for diagnosing camel and other food-animal diseases, conducting sero-surveillance, risk assessments, and pathogen characterization under the One Health approach. It also provides technical support and capacity building for regional laboratories across Africa and the Middle East. Equipped with advanced sequencing technologies—including Sanger and next-generation sequencers—and bioinformatics tools, the center has become a key regional reference for complex disease investigations.

The presentation outlined the joint investigation between ADAFSA, the Ethiopian Ministry of Agriculture, FAO, and WOAH experts following an official request from Ethiopian authorities in 2022 to help identify the cause of high camel mortality known locally as Unknown Camel Disease (UCD). This condition, long reported in the Horn of Africa, caused severe economic losses, but no definitive pathogen had been identified despite multiple studies.

A multidisciplinary team comprising pathologists, molecular biologists, and veterinarians from ADAFSA traveled to Ethiopia, visiting Yabelo district, one of the worst-affected areas. During the three-day field mission, they met local farmers, collected epidemiological data, and performed necropsies on diseased and dead camels. In total, 117 samples were collected—swabs, tissues, blood, feces, and ticks—and divided between local Ethiopian archives and ADAFSA laboratories in Abu Dhabi for advanced analysis.

Post-mortem findings revealed that the heart, intestines, lymph nodes, and kidneys were the most affected organs. Histopathology indicated coccidiosis,

verminous enteritis, and sarcocystis—likely secondary or opportunistic infections that suggested underlying viral immunosuppression. Parasitological analysis confirmed mixed infestations of Eimeria, Trichuris, and Trichostrongylus species, while tick identification included Hyalomma, Rhipicephalus, and Amblyomma species. Bacteriological culture yielded only environmental contaminants, consistent with field sampling conditions.

No virus was isolated through cell culture due to sample degradation during transport. However, the molecular investigation yielded significant results. Using pan-family real-time PCR assays targeting major viral families—Flaviviridae, Coronaviridae, Paramyxoviridae, and Bunyaviridae—positive amplification was detected for flaviviruses in 18 of 35 tissue samples and 3 of 32 swab samples. Sequencing and bioinformatics analysis identified the pathogen as Wesselsbron virus (WSLV), a mosquito-borne flavivirus previously unreported in camels.

Following this discovery, a specific real-time PCR assay was developed and validated at ADAFSA, increasing the number of confirmed positives to 25 tissue samples and 3 blood samples. The partial genomic sequence was deposited in the GenBank database, marking the first recorded identification of Wesselsbron virus in camels globally. Phylogenetic analysis classified the isolates under Clade I, known for its higher pathogenicity compared to Clade II.

Background information on Wesselsbron virus showed it was first isolated in South Africa in 1955 and is known to infect sheep (causing abortion and fetal malformations), horses (causing neurological symptoms), and humans (producing febrile illness). The detection of the virus in camels underscores its zoonotic potential and expands its known geographic and host range.

The findings were later published in Emerging Infectious Diseases journal under the title "Molecular Detection of Wesselsbron Virus in Dromedary Camels", providing the first molecular evidence linking WSLV to camel mortality.

The study also incorporated capacity building for Ethiopian laboratories, where ADAFSA experts helped establish and validate molecular tests for WSLV, confirming the virus in archived local samples. This collaboration strengthened regional diagnostic capacity and validated cross-border surveillance under the One Health framework.

The presentation concluded with recommendations for further research, including broader surveillance across East Africa, whole-genome sequencing, and experimental infection studies to confirm pathogenicity in camels. The investigation also emphasized the importance of entomological sampling to identify the mosquito species involved in transmission—a gap to be addressed in future phases.

In closing, the speaker reiterated that this discovery marks a milestone for veterinary diagnostics and One Health collaboration, providing new insights into emerging zoonotic threats in arid ecosystems and reinforcing ADAFSA's leadership in regional biosecurity and molecular epidemiology.

PRESENTATION

SUSTAINABLE PLANT-BASED FOOD SYSTEMS AND PROCESSING TO ADDRESS FOOD SECURITY, FOCUSING ON ALTERNATIVE PROTEIN

Andrew Lee
Operations Director, National Alternative Protein Innovation Centre (NAPIC)

The presentation explored the urgent need to transition toward sustainable, diversified protein sources as a key pillar of global food security and climate resilience. It highlighted how plant-based and alternative proteins can help reduce the environmental footprint of food systems while maintaining nutritional adequacy for a rapidly growing global population.

The speaker began by emphasizing that current food consumption habits are deeply cultural and resistant to change, yet transformation is necessary. With the global population expected to reach 8.5 billion by 2030 and 10 billion by 2050, food demand will surge by 50%, requiring 50% more energy and 30% more freshwater. Moreover, as diets shift toward higher meat consumption in developing regions, the world will need an additional 120 million hectares of agricultural land, putting unprecedented strain on ecosystems and biodiversity.

Currently, 83% of global agricultural land is used either directly or indirectly for livestock production—70% for grazing and 43% of cropland for growing animal feed. This inefficiency underscores the need for diversification. If humanity collectively adopted a plant-based diet, the land required for food production could be reduced by up to 75%, freeing vast tracts for reforestation, biodiversity restoration, and carbon sequestration.

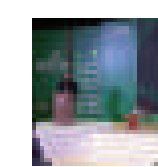
The discussion linked food production directly to climate change, noting that even if all non-food industries were decarbonized, unchecked emissions from agriculture would still push the planet beyond the 1.5°C global warming target. Transitioning toward plant proteins could yield a 90% reduction in greenhouse gas emissions and 70% less water use per unit of protein compared to beef.

Alternative proteins, Lee explained, encompass three major categories:

1. Plant proteins – already mainstream but facing sensory and acceptance challenges.
2. Fermentation-derived proteins – including biomass fermentation (e.g., fungal proteins like Quorn) and precision fermentation, which uses microbes to produce specific proteins such as rennet for cheese-making.

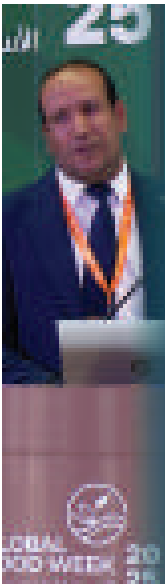
3. Cultivated (lab-grown) meat – a promising but emerging field enabling real meat production without raising animals, thereby addressing both sustainability and animal welfare concerns.

To accelerate innovation, the UK has established the National Alternative Protein Innovation Centre (NAPIC) — an open innovation ecosystem connecting four universities (Leeds, Imperial College London, Sheffield, and the James Hutton Institute) with over 150 industry partners, policymakers, and regulators. With a £38 million funding pool, NAPIC supports research, standard-setting, and commercialization through collaborative projects and frontier discovery programs. A core NAPIC initiative addresses why early generations of plant-based products struggled with consumer acceptance. While 16% of Europeans regularly purchase plant-based alternatives, most consumers cite taste and texture as barriers. The underlying culprit, according to new research, is astringency — a drying, gritty mouthfeel caused by protein aggregation and interaction with saliva. Using advanced analytical tools, NAPIC researchers demonstrated that plant proteins like pea and lupin aggregate into large structures that increase friction in the mouth and activate mechanosensory pathways in the brain, producing an unpleasant sensory experience unrelated to taste.
This scientific insight led to an innovative solution: "Microlub", a NAPIC spinout company that developed a patented technology to overcome astringency. The process encapsulates plant protein particles within hydrophilic polysaccharide coatings, creating a lubricated, creamy mouthfeel that mimics animal fat texture while retaining nutritional benefits. Backed by £3.5 million in investment and tested with over 1,000 consumers, this breakthrough has significantly improved the sensory appeal of plant-based foods, offering a viable path to mainstream adoption.
In response to a question about the health and safety of plant-based proteins, Lee clarified that long-term global studies (1961–2018) show balanced plant-rich diets enhance longevity and reduce chronic disease risks, particularly after early adulthood. He emphasized the importance of diversification rather than elimination—maintaining essential animal proteins for early development while reducing overall meat and processed meat consumption for long-term health and environmental benefits.
The presentation concluded with a call for global collaboration in alternative protein innovation, encouraging the establishment of similar ecosystems in the UAE and the wider region. Open knowledge-sharing, workforce upskilling, and regulatory frameworks were identified as essential next steps to ensure safe, affordable, and appealing plant-based and alternative protein products reach global consumers.



The session underscored a pivotal message:

"We cannot meet global climate and food security targets without transforming what we eat. Innovation ecosystems like NAPIC are not just research hubs—they are the bridges to a sustainable and resilient global food future."



PRESENTATION

DEVELOPMENT OF A NEW TECHNIQUE TO REDUCE ACRYLAMIDE DURING PROCESSING AND ELIMINATE ITS HARMFUL EFFECT USING LACTIC ACID BACTERIA

Mohamed Shehata
Lead Researcher, ADAFSA

Acrylamide forms mainly via the Maillard reaction between free asparagine and reducing sugars at high temperatures (frying, roasting, baking). It is water-soluble, highly reactive, and has been linked to carcinogenicity, neurotoxicity, hepatotoxicity, nephrotoxicity, and reproductive toxicity. Dietary exposure is highest in infants (baby foods/cereals) and children (French fries, baked goods, cereals), while adults are mainly exposed through coffee and fried/baked potato products; typical intakes from fries/bread/chips are ~10–25 µg/day, and ~2–5 µg/day from coffee/cakes/snacks.

The talk outlined a practical, food-grade strategy to curb acrylamide by leveraging lactic acid bacteria (LAB) rather than fragile enzymes (e.g., asparaginase) that demand tight pH/temperature control. The approach uses two LAB mechanisms: (1) rapid surface fermentation to deplete reducing sugars before high-heat processing, and (2) direct assimilation/biodegradation of acrylamide as a carbon source.

Screening started with 68 LAB strains (from yogurt, raw milk, and ripened cheese), narrowed to 40 for acrylamide reduction, then to three performers: "Videocoocus acetolactacia," Lactobacillus paracasei, and Lactobacillus plantarum. In model systems spiked at 3, 6, 9, and 12 µg/mL, these strains reduced acrylamide by up to ~45%, demonstrating assimilation capability. Process optimization with a Box–Behnken design identified near-neutral pH (~7), 35 °C, and ~24 h as optimal operating conditions.

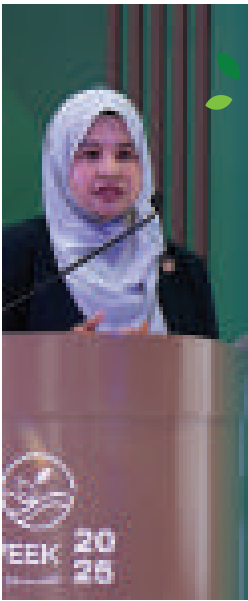
A fermented-milk prototype inoculated with 10 µg/mL acrylamide showed ~45% reduction within 7–14 days while maintaining technological quality (stable pH/acidity) and viable LAB counts (~7.8 log CFU/mL). This indicates feasibility for both mitigation and product fortification in a consumer-acceptable matrix.

KEY TAKEAWAYS

- **Targeting reducing sugars via fast LAB fermentation and allowing LAB to metabolize acrylamide provides a robust, eco-friendly alternative to enzyme-only strategies.**
- **Three selected strains achieved ~33–45% acrylamide reduction under food-relevant conditions.**
- **Process windows around pH 7, 35 °C, and 24 h balance efficacy with practicality.**
- **Successful application in fermented milk suggests broader potential across starch-rich foods (e.g., potato, bakery) with minimal changes to processing.**

RECOMMENDATIONS

- **Pilot integration of the selected LAB in pre-processing steps for high-risk products (fries, chips, bread crusts, biscuits).**
- **Validate performance in real manufacturing lines (sensory, shelf-life, toxicological endpoints).**
- **Develop guidance for pH/temperature/time control and starter-culture dosing tailored to each food matrix.**
- **Combine LAB with upstream sugar/asparagine management (raw-material selection, blanching, formulation tweaks) for additive reductions.**



PRESENTATION

INNOVATIVE AND SUSTAINABLE PROCESSING FOR FOOD SECURITY

Mohamed Shehata
Lead Researcher, ADAFSA

Prof. Yus Aniza's presentation offered a comprehensive overview of how innovative and sustainable food processing methods can contribute to global food security, while aligning with Halal principles and environmental sustainability. Her address interlinked the technological, ethical, and regulatory dimensions of modern food systems, emphasizing that innovation must advance alongside integrity and inclusivity.

She began by outlining the four pillars of food security — availability, accessibility, utilization, and stability — and noted that her focus would be on utilization, especially the regulatory and certification aspects related to Halal and Toyyib (wholesome) food systems. The global population surpassing eight billion has intensified demand for sustainable food production and processing, and with food demand projected to increase by 60% by 2050, innovative approaches are critical to meeting future nutritional needs while mitigating climate change, food waste, and supply chain vulnerabilities.

Prof. Yusof highlighted modern processing innovations such as high-pressure processing (HPP), pulsed electric field processing, precision fermentation, and advanced packaging technologies. However, she cautioned that these methods must be evaluated for energy use, greenhouse gas emissions, water consumption, and waste generation. For example, HPP was shown to have the highest energy use and emissions, while thermal pasteurization consumed the most water. Balancing technological progress with environmental stewardship remains a central challenge.

Transitioning to the Halal and Toyyib framework, she explained that Halal governs religious permissibility under Islamic law, while Toyyib relates to safety, cleanliness, quality, and ethical sourcing. In Malaysia, Halal certification is administered by JAKIM (Department of Islamic Development Malaysia), and in the GCC, by GSO (Gulf Standardization Organization). She stressed that innovation and sustainability must never compromise these foundational principles — especially when formulating or reformulating ingredients for value-added or upcycled products.

Prof. Yusof drew attention to pig-derived ingredients widely used in the food and pharmaceutical industries — such as gelatin, glycerin, emulsifiers, and mono- and diglycerides — that may appear in products like ice cream, margarine, toothpaste, and baked goods. Ensuring ingredient traceability is therefore a critical control point in Halal certification. She used gelatin as a case study, explaining that although it is a versatile and functional ingredient derived from collagen, its source (slaughtered vs. non-slaughtered animals) determines Halal status. Scientific methods such as electrophoretic profiling and species-specific peptide biomarkers help authenticate ingredient origins.

The professor also discussed naturally occurring alcohols in beverages and shared Malaysian research establishing permissible limits: products with less than 1% ethanol content and below 0.5% food-derived alcohol can qualify as Halal. She presented findings from collaborative studies on kombucha fermentation, which showed that unflavored kombucha remained below 1% ethanol during 30 days of fermentation, but alcohol content exceeded this threshold after 16–18 weeks of storage — underscoring the need for monitoring and possibly pasteurization or preservatives for compliance.

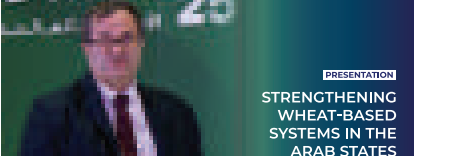
Emerging protein sources such as cultured meat, insect proteins, and algae-based foods were also discussed in light of their Halal acceptability. While Singapore has approved cultured meat, Malaysia's religious authorities continue to deliberate on its permissibility. Similarly, despite insects' high protein value, Malaysia's Fatwa Council has not yet sanctioned their consumption. Even with plant-based innovations like algae, Prof. Yusof noted the need to verify the growth medium used in cultivation, as it may contain non-Halal elements.

The session also explored the role of artificial intelligence (AI) in food authentication. Combining chromatography and spectroscopy, AI can differentiate between Halal and non-Halal components in meats, dairy, fats, and processed foods. This technology could revolutionize traceability systems, enhance regulatory efficiency, and strengthen consumer trust.

In conclusion, Prof. Yusof emphasized that innovation and sustainability must be guided by ethical responsibility. She summarized her message with the statement:

"Innovation guided with integrity, where sustainable technology and Halal science unite, can nourish humanity with trust and responsibility."

Her presentation underscored that achieving global food security demands more than technological breakthroughs — it requires a holistic system where scientific progress, environmental care, and moral values work hand in hand to build resilient, equitable, and trustworthy food systems.



PRESENTATION

STRENGTHENING WHEAT-BASED SYSTEMS IN THE ARAB STATES

Michael Baum
Research Team Leader, ICARDA
(in collaboration with UNDP)

The session on strengthening wheat-based systems in the Arab states, jointly presented by ICARDA and UNDP, explored collaborative strategies to build resilience in one of the region's most critical crops—wheat. The presentation emphasized how modern science, technology, and inclusive value chains can transform wheat production systems to meet the twin challenges of food security and climate adaptation across the Arab region.

The agricultural sector in the SIWANA (Syria, Iraq, West Asia, and North Africa) region plays a central role in ensuring food security and economic stability. Wheat, in particular, is the most important crop, serving as a vital source of calories and employment along the value chain—from farming and processing to distribution and transport. Yet the region faces serious constraints: climate change, desertification, land salinity, and heavy dependence on imports have made wheat production both vulnerable and politically sensitive. Past crises—such as the 2008 food price shock, the COVID-19 pandemic, and the war in Ukraine—have underscored the urgent need to strengthen domestic production systems and reduce food loss and waste.

MODERNIZING WHEAT SYSTEMS FOR RESILIENCE

Building resilience in wheat production requires modernization at every stage—from farm to market. The presentation highlighted the importance of precision agriculture, improved agronomy, and scientific innovation to increase yields and efficiency. Central to this transformation are:

- **Precision farming tools for smart irrigation, pest detection, fertilization, and climate advisory systems.**
- **Ecosystem-based approaches to manage soil, water, and biodiversity resources more sustainably.**
- **Development of high-yielding, stress-tolerant wheat and legume varieties adapted to local environments.**
- **Inclusive policies to empower smallholders, improve input delivery systems, and enhance market access.**

Precision agriculture enables real-time decision-making through smart sensors, weather analytics, and cloud-based advisories, allowing farmers to optimize input use while minimizing waste and costs.

ECOSYSTEM MANAGEMENT AND CROP DIVERSIFICATION

Under rainfed systems, yield gaps remain significant compared to irrigated lands. Optimal management can narrow these gaps through crop rotation, fallow land utilization, and diversification with legumes. Each crop species in the region aligns with distinct rainfall zones:

- **Bread wheat and faba bean thrive in areas with 350–500 mm of annual rainfall.**
- **Durum wheat and chickpea prefer about 400 mm.**
- **Barley and lentil perform better under semi-arid conditions (~250 mm).**
- **Cactus and grasspea survive in the driest zones.**

These rotations not only stabilize yields but also improve soil fertility through nitrogen fixation. Mapping these agroecological zones helps design location-specific cropping systems that balance productivity with sustainability.

ACCELERATING GENETIC IMPROVEMENT

One of the most impactful innovations discussed was speed breeding, a technology that drastically shortens the breeding cycle. Using LED lighting systems that simulate long-day conditions, ICARDA's facility can produce five generations of wheat per year, compared to just one or two under traditional conditions. This reduces the development time for new varieties from 15 years to around 10 years, enabling quicker responses to emerging climate and pest pressures.

The facility also integrates genomic selection and digital phenotyping, allowing scientists to identify desirable traits with greater precision. High-resolution spectral cameras now capture data across entire plots, enhancing efficiency in evaluating drought and disease resistance.

Through its international nursery system, ICARDA annually distributes elite wheat, barley, lentil, chickpea, and faba bean lines to over 100 cooperators in 50 countries, free of charge. Partners test these under local conditions to identify high-performing lines for release or breeding, fostering global collaboration and genetic exchange.

EMPOWERING FARMERS AND COOPERATIVES

Beyond research, the initiative places strong emphasis on farmer empowerment and inclusive value chains. Training programs help smallholders access new agronomic knowledge and technologies, while also facilitating financing, crop insurance, and market access.

Projects such as Technologies for African Agricultural Transformation (TAAT), funded by the African Development Bank, have already improved wheat seed production and farmer outreach in six African countries. Similarly, drought insurance schemes implemented in partnership with the World Food Programme offer critical protection to farmers against climate shocks.

Women's participation has also been strengthened through initiatives like MetMed-WHEAT, funded by the European Union. This project promotes healthier traditional foods such as pasta, couscous, burghul, and freekeh, using improved semolina blends that combine wheat with barley or lentils. Women's cooperatives in Morocco, Tunisia, and Lebanon receive training, management support, and access to packaging and marketing resources, with collaboration from Oxfam to ensure sustainability and inclusion.

MARKET ACCESS, DIGITALIZATION, AND VALUE CHAIN EFFICIENCY

Enhancing value chain efficiency is crucial to ensuring profitability and stability for producers. The initiatives discussed include:

- **Modern post-harvest infrastructure, such as climate-controlled silos and processing facilities.**
- **Public-private partnerships to bridge gaps in logistics and certification.**
- **Expansion of digital market and advisory platforms, such as ICARDA's Egypt-specific tool that provides localized weather forecasts, crop advice, and price data.**

These systems are enabling farmers to make informed decisions, reduce post-harvest losses, and better connect with buyers.

POLICY, INSTITUTIONAL SUPPORT, AND MEASURED IMPACT

Long-term success depends on aligning national policies with regional food security frameworks. Capacity-building for local institutions and cooperatives is key to ensuring continuity and scaling of innovations.

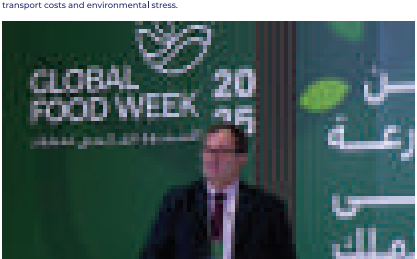
Evidence from Egypt illustrates this impact: 63% of wheat acreage is now planted with varieties derived from the international system (ICARDA and CIMMYT), and 58% of the total area has adopted at least one modern technology. The resulting productivity gains—an additional 0.7 million tons of wheat annually, valued at $85 million—highlight the value of consistent policy and institutional engagement.

The Enhancing Food Security in Arab Countries Project, implemented across 10 countries over 12 years, remains one of the region's most successful models. With a $20 million investment, it generated 1.5 million tons of additional wheat, $450 million in income, and improved the livelihoods of over two million people—a 22:1 return on investment. The program's success was recognized with the Almarai Prize for Scientific Creativity from Saudi Arabia.

KEY REFLECTIONS AND OUTLOOK

The presentation concluded by emphasizing that the future of Arab wheat systems depends on an integrated approach that blends technological innovation, ecosystem stewardship, and social inclusion. The message was clear: strengthening food security requires "innovation from the gene to the grain to the market."

In the discussion, when asked about the concept of underground farming, it was noted that such systems—akin to vertical or indoor farming—offer promising opportunities for land-constrained regions like the UAE. By leveraging LED-based lighting and controlled environments, underground production could expand urban food capacity while reducing transport costs and environmental stress.



PRESENTATION

ASSESSING SAP FLOW DISTRIBUTION PATTERNS FOR EARLY DETECTION OF RED PALM WEEVIL INFECTION IN DATE PALM TREES

Ali Al Shrouf
Lead Researcher, ADAFSA

Ali Al Shrouf presented an innovative pilot study from ADAFSA's research station in Al Khatem that applies agritech-driven sensing to one of the region's toughest agricultural challenges: the red palm weevil (RPW). Drawing on his background in agricultural technology, he described a system that allows researchers to "listen" to the physiological signals of date palms through micro sap-flow sensors, likening the approach to a plant's "ECG."

CONCEPT AND OBJECTIVE

The project aimed to test whether sap-flow patterns—tiny movements of water within palm tissues—could act as early indicators of RPW infestation before visible damage appears. Al Shrouf explained that while traditional trunk-based sensors can harm vascular tissues, micro sap-flow sensors attached to the fronds are non-destructive and capable of continuous real-time monitoring.

These sensors transmit data wirelessly through gateways to a cloud-based analytics platform, allowing the team to interpret stress responses caused by pests, salinity, drought, or other factors.

EXPERIMENTAL DESIGN

Over the course of a year, more than 100 date palms were equipped with the sensors. Some trees were deliberately infested with RPW larvae, while others served as uninfested controls. To ensure objectivity, Al Shrouf's field team introduced infestations at unknown times without informing the analysis team, allowing him to test how early the system could detect the pest independently.

In addition to sap-flow sensors, the setup included soil moisture probes and weather monitoring instruments for temperature, humidity, and wind speed. These parameters were essential to differentiate pest-induced stress from environmental influences such as heat or drought.

KEY FINDINGS

Al Shrouf highlighted a striking result: the sap-flow system detected infestation symptoms just six days after the artificial infection, compared to 26 days required for visible symptoms to appear. This early warning window could enable farmers to intervene before irreversible trunk damage occurs.

He illustrated how normal sap-flow patterns follow a steady daily rhythm—rising with daytime transpiration and falling at night. In

infected palms, however, this rhythm broke down, producing erratic or "noisy" signals. The pilot also revealed that sap-flow readings responded instantly to physical damage (such as cutting a frond), confirming the sensor's high sensitivity.

TECHNOLOGICAL AND ANALYTICAL INSIGHTS

According to the speaker, the pilot used more than 200 sensors connected to a unified data platform, allowing real-time validation, data visualization, and automatic flagging of inactive sensors. The team correlated sap-flow data with environmental factors to understand how temperature, humidity, and wind patterns influenced transpiration and signal behavior.

He explained that high humidity can paradoxically increase sap-flow because palms elevate transpiration to cool themselves—a physiological adaptation that must be accounted for when interpreting data. This reinforces the need for expert analysis and automated algorithms to correctly identify RPW-related anomalies.

CHALLENGES AND NEXT STEPS

Al Shrouf acknowledged that while the pilot proved the system's potential, scaling it up poses challenges.

- **The technology is currently tree-specific, meaning every palm would need its own sensor—a costly and labor-intensive prospect for large farms.**
- **Sap-flow signals can also reflect multiple stressors, not just RPW. Distinguishing between pest infection, drought, and salinity requires further refinement of RPW-specific signal indicators and AI-based pattern recognition.**

To address these issues, his team is exploring a multi-sensor approach—combining sap-flow monitoring with acoustic detection, pheromone traps, and satellite-linked stress mapping.

Al Shrouf concluded that early detection remains the most difficult and critical stage of RPW management—comparable, as he put it, to detecting a "silent disease." The pilot demonstrated that sap-flow sensing can provide a powerful early-warning tool for farmers and researchers alike.

He emphasized the next stage will focus on automation and scalability, using machine learning and integrated monitoring systems to identify infected trees with precision, enabling timely, targeted intervention rather than blanket treatments.

In essence, his presentation showcased how digital agriculture and plant-based diagnostics can transform pest management, aligning with ADAFSA's broader mission to advance innovation-driven food security across the UAE and the wider region.

KEYNOTE PRESENTATION

ASSESSMENT OF BARLEY VARIETIES FOR GROWTH, YIELD, AND NUTRITION UNDER DIFFERENT IRRIGATION AND SALINITY REGIMES IN THE ARID CONDITIONS OF THE UAE

Dr. Ihsan Jumaa
Lead Researcher, ADAFSA

Dr. Ihsan Jumaa delivered a compelling keynote presentation that highlighted ADAFSA's ongoing research collaboration with ICARDA to identify resilient barley varieties capable of thriving under the UAE's harsh environmental conditions. Acknowledging the challenges of heat, salinity, and water scarcity, he shifted the focus from "limitations to possibilities," posing a simple yet powerful research question: **Can we efficiently grow high-yielding, nutritious barley varieties using saline water in the UAE?**

BACKGROUND AND COLLABORATION

The project is part of a broader ADAFSA–ICARDA partnership that encompasses seven interlinked research initiatives covering forage crops, animal nutrition, and economic assessments. Within this framework, the barley study aims to evaluate growth performance and salinity tolerance, identify high-yielding and stress-resilient genotypes, assess nutritional value, and ultimately carry out livestock feeding and cost-benefit trials.

This large-scale field experiment evaluated 20 fodder and forage species comprising 47 varieties—making it one of the most comprehensive trials ADAFSA has ever implemented.

WHY BARLEY MATTERS

Barley is globally ranked fifth in cultivated area and twelfth in total production, reflecting its adaptability and resilience across climatic zones. Around 70% of the world's barley is used for animal feed, 30% for malting and food products, and 5% for seed retention. Dr. Jumaa emphasized its nutritional balance—moderate crude protein and high carbohydrates—which makes it a key component in sustainable crop-livestock systems.

ICARDA'S BARLEY BREEDING PROGRAM

Dr. Jumaa outlined the extensive reach of ICARDA's barley breeding program, which has released more than 25 modern varieties across 46 countries, encompassing both

spring and winter types. The UAE experiment used two ICARDA product lines: feed barley for arid and semi-arid regions (Jamal lines) and feed-forage barley for favorable environments (Al Ain lines). These lines have shown yield advantages of up to 30% over commercial checks under drought and salinity stress.

EXPERIMENTAL DESIGN AND METHODOLOGY

The field experiment used a split-plot design with salinity as the main factor and varieties as subplots.

- **Salinity levels: 6,000, 10,000, and 14,000 ppm.**
- **Irrigation levels: 100%, 75%, and 50% of evapotranspiration potential (ETc).**

Each treatment was replicated, and data were collected on germination, biomass yield, NDVI, and nutritional composition. Soil preparation, fertilization, and leaching were carefully managed to control salt buildup in the plots.

KEY FINDINGS

Under increasing salinity, overall biomass declined, but clear genotypic variation emerged. Certain varieties maintained strong growth and regrowth capacity despite stress.

- **Top performers under salinity: Jamal 10, Jamal 12, and Check 1, which produced the highest total dry biomass.**
- **The first cutting contributed 40–60% of total yield, reflecting strong early-season growth.**

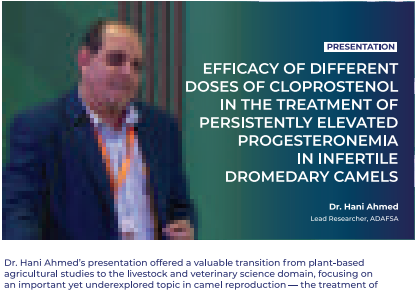
Similar trends were observed under water stress. Reducing irrigation from 100% to 50% ETc reduced biomass by 20–27%, yet Jamal 10, Jamal 12, and Check 1 continued to outperform others, showing good adaptability to limited water. NDVI data confirmed that plant vigor dropped under both salinity and drought stress but remained relatively higher for the same top-performing genotypes.

Preliminary nutritional analysis for Jamal 10 showed crude protein levels reaching 15%, with acceptable fiber content (ADF), demonstrating its value as a high-quality forage under saline conditions. Despite regular leaching, soil salinity in higher treatments rose to 5–6 dS/m, while control plots remained stable.

Dr. Jumaa concluded that salinity and water deficit significantly affect barley growth, physiology, and biomass, but genetic variability offers clear opportunities for selecting resilient genotypes. Jamal 10 and Jamal 12 consistently ranked among the best performers across both salinity and irrigation experiments, indicating strong adaptability.

The study suggests that maintaining irrigation at about 75% of ETc strikes a balance between conserving water and sustaining yield. He stressed that breeding and testing are continuous processes requiring collaboration with stakeholders to ensure long-term adaptation. The high forage quality of these varieties supports crop–livestock integration and sustainable feed production in the UAE.

She ended with a hopeful message that reflected the essence of his work: ***"Our future in agriculture is not defined by our constraints, but by our ability to innovate beyond them."***



PRESENTATION

EFFICACY OF DIFFERENT DOSES OF CLOPROSTENOL IN THE TREATMENT OF PERSISTENTLY ELEVATED PROGESTERONEMIA IN INFERTILE DROMEDARY CAMELS

Dr. Hani Ahmed
Lead Researcher, ADAFSA

Dr. Hani Ahmed's presentation offered a valuable transition from plant-based agricultural studies to the livestock and veterinary science domain, focusing on an important yet underexplored topic in camel reproduction — the treatment of persistently elevated progesteronemia, or "false pregnancy," in infertile dromedary camels.

UNDERSTANDING THE PROBLEM

He began by drawing a comparison with human and other animal physiology, explaining that a "false pregnancy" occurs when an animal exhibits physical and behavioral signs of pregnancy without actually being pregnant. While this condition is well documented in dogs, goats, and cattle (known as resistant corpus luteum or elevated progesteronemia), little is known about its occurrence in camels, which he described as "unlucky animals" due to the limited scientific literature available about their reproductive physiology.

This condition poses serious economic implications for camel breeders. When a camel is mistakenly assumed to be pregnant, months of feeding and management are invested without any productive outcome. The delay reduces reproductive efficiency, profitability, and ultimately affects food security and livestock sustainability in the UAE.

RESEARCH AIM AND EXPERIMENTAL DESIGN

Dr. Ahmed's study sought to answer two crucial questions:

1. **Do camels suffer from elevated progesteronemia similar to cattle?**
2. **What is the most effective and economical hormone dose for treatment?**

The hormone in question is Cloprostenol, a prostaglandin analogue commonly used to induce regression of the corpus luteum in animals. The research aimed to determine the optimal therapeutic dose that would effectively treat the condition while reducing treatment costs for breeders.

A total of 20 camels diagnosed with persistently high progesterone levels were included in the study. Each animal underwent:

- Ultrasound examination to observe ovarian morphology and detect non-ovulated follicles.
- Blood sampling to measure progesterone levels.
- Uterine swabbing to identify bacterial infections commonly associated with elevated progesterone, such as endometritis or metritis.

The animals were then divided into two treatment groups: one received 3 mL of Cloprostenol per dose, and the other received 5 mL.

KEY FINDINGS

The study found that endometritis, an inflammation of the uterine lining, often accompanied elevated progesteronemia. Laboratory cultures revealed Staphylococcus haemolyticus as the most prevalent bacterial species isolated from infected camels. Gentamicin was identified as the most effective antibiotic against this pathogen, and was therefore recommended as part of the treatment protocol.

Ultrasound findings showed the presence of persistent, unruptured follicles in affected camels — a key indicator of elevated progesterone levels and reproductive inactivity.

After comparing treatment responses, Dr. Ahmed concluded that:

- **Camels require either three doses of 0.75 mg Cloprostenol or two doses of 1.25 mg Cloprostenol to effectively resolve the condition.**
- **These doses successfully induced regression of the corpus luteum and restored normal reproductive cycles.**

ECONOMIC AND PRACTICAL IMPACT

One of the major outcomes of the study was cost efficiency. The optimized dosing regimen reduced hormone usage and consequently lowered treatment costs by approximately 600 AED per animal, offering significant savings for camel breeders.

Dr. Ahmed emphasized that this protocol now serves as an official treatment guideline adopted across ADAFSA-affiliated veterinary clinics and hospitals in Abu Dhabi, Al Ain, and Al Dhafra regions. Workshops and training sessions have been conducted to disseminate these findings to field veterinarians, ensuring consistent application and better reproductive management outcomes in camel herds.

BROADER SIGNIFICANCE

This study represents one of the first documented works globally to establish an effective and standardized dose–response protocol for treating elevated progesteronemia in dromedary camels. It not only contributes to improving fertility management in camel populations but also supports the UAE's broader goal of achieving livestock sustainability and food security through scientific innovation.

Dr. Ahmed concluded by expressing his gratitude to ADAFSA for supporting applied veterinary research and reaffirmed his commitment to expanding knowledge in camel reproduction, a field he described as vital yet often overlooked.

"By understanding and treating reproductive disorders efficiently, we save not only time and money but also ensure a sustainable and productive camel industry for the UAE." — Dr. Hani Ahmed

PRESENTATION

PLANT-BASED MEAT

BETWEEN FOOD INNOVATION AND RESPONDING TO THE CHALLENGES OF OUR TIME

Dr. Ibtesam Saeed
Senior Food Analyst, Abu Dhabi Quality & Conformity Council (UAE)

Dr. Ibtesam Saeed presented a comprehensive overview of plant-based meat as a modern response to global food challenges. Her session emphasized that the innovation behind plant-based proteins extends beyond dietary trends—it is part of a broader effort to balance sustainability, food security, and human health.

HISTORICAL DEVELOPMENT

She outlined the historical progression of plant-based meat, beginning in the 1960s with early protein sources such as tofu and wheat gluten. The 1990s introduced industrial soy protein extraction and extrusion technologies that created the first meat-like textures. The early 2010s marked a revolution in this field with companies like Beyond Meat and Impossible Foods introducing the concept of plant-based heme to simulate flavor and aroma similar to animal meat.

Between 2020 and 2025, significant advancements in biotechnology, artificial intelligence, and precision fermentation have led to the development of hybrid and highly realistic alternatives, reflecting the growing consumer and governmental focus on sustainable protein production.

DEFINITION AND PRODUCTION PROCESS

According to Dr. Ibtesam, plant-based meat refers to high-protein food products derived from plant sources that are structured to replicate the sensory and nutritional properties of animal meat. The production process involves:

1. **Selecting high-protein raw materials such as soy, pea, and potato.**
2. **Isolating protein fractions from other components like fiber and carbohydrates.**
3. **Conditioning and modifying the proteins to enhance their texture.**
4. **Applying extrusion technology, which uses heat and pressure to align protein molecules into fibrous structures resembling muscle tissue.**
5. **Adding plant-based fats, seasonings, and flavors to replicate juiciness and aroma.**
6. **Forming and packaging into final consumer products such as burgers, sausages, and nuggets.**

TECHNOLOGICAL INNOVATIONS

The presentation highlighted several innovations shaping the plant-based meat industry. Protein engineering enables scientists to modify molecular structures for elasticity and bite. Precision fermentation introduces collagen-like compounds and fats to replicate the sensory richness of animal meat. Artificial intelligence is used to optimize formulations for better flavor and texture, while extrusion remains central to structuring plant proteins into realistic meat-like fibers. Dr. Ibtesam also noted that modern advances have achieved notable success in mimicking poultry and fish, though red meat remains more complex to replicate.

NUTRITIONAL AND ENVIRONMENTAL COMPARISON

Plant-based meats generally have zero cholesterol, higher fiber content, and fewer saturated fats compared to animal meat. However, they may have lower protein density and higher sodium levels, which remain subjects of ongoing research. Combining multiple plant proteins, such as soy and wheat, can improve amino acid balance.

From an environmental perspective, shifting towards plant-based protein production reduces greenhouse gas emissions by up to 90%, while also conserving land and water resources. Dr. Ibtesam stressed that these reductions align closely with global and UAE sustainability goals.

CHALLENGES AND CONSUMER PERCEPTION

Despite technological progress, the sector faces challenges in cost competitiveness, sensory replication, and public perception. Some consumers remain cautious due to concerns about ultra-processing, allergens, and transparency in ingredient labeling. Studies conducted in Europe and the UK reveal that many plant-based meats are classified as highly processed, prompting manufacturers to reformulate for cleaner, simpler labels. Dr. Ibtesam emphasized that consumer education and trust are critical for broader adoption.

Role in Food Security and Policy Recommendations

Plant-based proteins, she explained, can play an essential role in strengthening national food security strategies by diversifying protein sources and reducing dependency on livestock. To realize this potential, she recommended:

- **Continued government investment in agricultural and food innovation research.**
- **Incentives for private companies to localize production.**
- **Technology transfer and specialized training to build a skilled workforce.**

  Public awareness initiatives in schools and universities to encourage acceptance and informed consumption.

ENSURING QUALITY AND SAFETY

Dr. Ibtesam highlighted the Abu Dhabi Quality & Conformity Council's (QCC) efforts in ensuring product integrity through comprehensive testing. The Council conducts chemical analyses for protein and nutrient composition, microbiological tests for food safety, and physical evaluations to assess color, texture, and aroma. These practices help maintain the reliability and safety of plant-based food products across the UAE market.

UAE'S COMMITMENT TO ALTERNATIVE PROTEIN INNOVATION

She underlined the UAE's leadership in alternative protein innovation through initiatives such as the Agwa Cluster partnership with Neos Group (Switzerland). This collaboration aims to establish an advanced regional innovation center dedicated to alternative proteins, supporting national goals of food self-sufficiency, sustainability, and industrial competitiveness.

CONCLUSION

In closing, Dr. Ibtesam stated that plant-based meat represents a crucial step toward the future of sustainable food systems. It offers a pathway to balance health, ethics, and environmental responsibility without eliminating traditional animal-based foods. Ongoing improvements in biotechnology, nutritional design, and regulation will be essential in ensuring that these products become affordable, healthy, and trusted by consumers.

AGENDA

21 OCT - Farming Innovation

12:30 Welcome Note

12:40 Presentation: Driving Innovation Across the Agricultural Value Chain
Marc Bou Zeidan, PhD
Cluster Executive Director, QOOT

13:10 Presentation: From Asymmetry to Alliance: A Digital Food Corridor Africa – GCC
Daniel Immerzeel, CEO, Vermicil Africa

13:40 Keynote Address - Reskilling Traditional Farmers for A Digital-First Agrifood Economy
Satyam Bose, Founder & CEO, Virenxia

14:10 Fireside Chat: Growing Dates in a Thirsty World: Solving Water Challenges in Palm Cultivation
Dr. Ewa Szukalska, Irrigation Specialist, FAO

14:40 Presentation: Animal Production at a Crossroads: Tackling Antibiotic Use and Antimicrobial Resistance
Ghada Ahmed **El Derdiri Abdel Wahab** ADAFSA

22 OCT - Investment

10:00 Opening and Welcome Address
H.E Dr. Tareq Al-Ameri, Director General ADAFSA

10:10 Presentation: The Agricultural Investment Landscape in Abu Dhabi – Opportunities, Incentives, and Legislation
Mansour Al Marar, KEZAD

10:45 Panel Discussion: Turning Waste into Wealth: Investing in Technology to Divert Agrifood Waste from Landfills (English)
Rabih El Chaar – Nadeen
Khaloud Alnuwais, Emirates Foundation
Theophilus Akwezuo, Agthia
Dr. Afra Al Mansoori, ADAFSA

11:30 Fireside Chat: Innovation and Technology in Sustainable Agriculture - Digital Farming, Artificial Intelligence, and Precision Agriculture
Rabih El Chaar– Nadeera

11:55 Fireside Chat: Financing Agricultural Projects – The Role of Banks
Shaker Farid Abdulrahman Zaidi, Emirates Development Bank
Dr Ahmad Mukhtar, FAO Representative Ad Interim to the United Arab Emirates

12:30 Panel Discussion: Success Stories in Agricultural Investment – Local and International Case
Abdulrahman Rashid Al Shamsi, Abu Dhabi Agricultural Club
Fadi Nasser Al Saadi, Abu Dhabi Agricultural Club
Dr. Hamad Saif Muaddad Al-Mashghouni

13:30 ADAFSA Awarding Ceremony

14:45 Presentation: Sustainable and Novel Processing for Food Security
Dr. Kevin Cash, Senior Manager, Strategy and Programmers, UIUCA

15:05 Presentation: Bio-Innovation for Secure and Sustainable Food Systems
Dr. Salwa Karboune,
Professor & Associate Dean, McGill University

15:30 Poster Competition Winners Announcement

23 October – Education

10:25 Opening Remarks
H.E Ahmed Khaled Abdo, Deputy Director General- Acting, ADAFSA

10:30 Presentation: Role of sustainable livestock production towards food security in arid regions
Dr. Juan Loor, Professor, University of Illinois Urbana-Champaign

10:50 Presentation: Honeybee Diseases and Pests: Diagnosis, Prevention, and Treatment
Dr. Saad Masri, Expert, ADAFSA

11:10 Presentation: Sustainable Agriculture and Food Systems Education for Food Security
Dr. Andreas Gattinger, Professor, Justus Liebig University Giessen

11:30 Presentation: Using advanced molecular techniques to pinpoint Wesselsbron virus as an emerging pathogen during the investigation of unknown cause of camel mortality in Ethiopia
Dr. Hassan Ishag, Expert, ADAFSA

11:50 Presentation: Sustainable Plant-based food systems and processing to address food security, focusing on alternative protein
Dr. Andrew Lee, Operations Director, National Alternative Protein Innovation Centre (NAPIC)

12:10 Presentation: Development new technique to reduce the level of acrylamide during processing and eliminate its harmful effect by lactic acid bacteria
Dr. Mohamed Shehata, Lead Researcher, ADAFSA

12:30 Presentation: Innovative and Sustainable Processing for Food Security
Dr Yus Aniza Yusof, Professor & Director, Halal Products Research Institute, University Putra Malaysia (UPM)

12:50 Presentation: Strengthening Wheat-Based Systems in the Arid Conditions
Dr Michael Baum, Research Team Leader

14:00 Presentation: Assessing Sap Flow Distribution Patterns for Early Detection of Red Palm Weevil Infection in Date Palm Trees
Ali Al Shrouf, Lead Researcher, ADAFSA

14:20 Keynote Presentation: Assessment of Barley varieties for grain, yield and nutrition under different irrigation and fertilizer regimes in the arid conditions of the UAE
Dr. Ihsan Jumaa, Lead Researcher, ADAFSA

14:40 Presentation: Efficacy of Different Doses of Cloprostenol in the Treatment of the Persistently Elevated Progesteronemia in Infertile Dromedary Camels
Dr. Hani Ahmed, Lead Researcher, ADAFSA

15:00 Presentation: Plant-Based Meat: Between Food Innovation and Responding to the Challenges of Our Time
Dr Ibtesam Saeed, Senior Food Analyst, Abu Dhabi Quality & Conformity Council (UAE)

15:20 QCC Workshops

SPEAKERS

AGRITECH

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Senior Food Analyst, Abu Dhabi Quality & Conformity Council (UAE)

H.E. Dr. Tareq Al-Ameri
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Founder & CEO, Vivimea

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Fadel Nasser Al Saadi
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The AgriTech Forum and Scientific Research Day held during Global Food Week 2025 served as a dynamic platform for advancing dialogue on sustainable agriculture, innovation, and food security. Through the collaborative efforts of ADAFSA, UAE University, and international research partners, the event highlighted how science-led innovation continues to transform the UAE's agri-food landscape.

The sessions showcased the nation's growing capacity for research excellence from pioneering pest detection technologies and salinity-tolerant crop varieties to improving livestock health and developing future-ready food innovations such as plant-based proteins. Each presentation reflected the UAE's broader commitment to building a resilient and knowledge-based agricultural system, aligned with the National Food Security Strategy 2051 and the UAE's sustainability vision.

More than a showcase of research, the forum underscored the importance of collaboration between policymakers, scientists, and industry stakeholders in translating knowledge into real-world impact. The event reaffirmed that achieving long-term food and agricultural sustainability requires continuous investment in research, technology adoption, and human capital development.

As the UAE continues to position itself as a regional hub for agricultural innovation, the outcomes of Global Food Week 2025 reinforce its leadership in shaping the future of sustainable food systems—locally, regionally, and globally.

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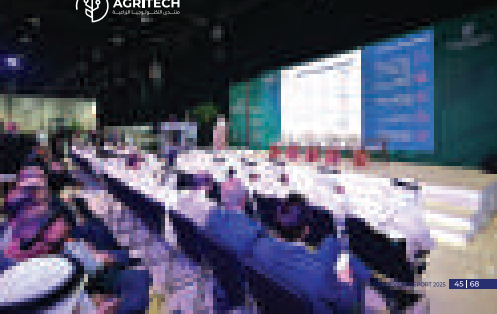

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