A biosecure, resilient food supply system

Safe food supply chains through big data and analysis

Identifying supply chain vulnerabilities

- Vulnerabilities in agricultural supply chains can lead to food shortages during crises — as during the COVID-19 pandemic — and unconventional attacks in the U.S.

- Food supply vulnerabilities must be addressed through research, technology development and multilateral public-private collaboration.

- Texas A&M AgriLife faculty data scientists and researchers bring the expertise to solve these challenges.

TEXAS A&M AgriLife RESEARCH	CROSS-BORDER THREAT SCREENING AND SUPPLY CHAIN DEFENSE	IIAD
Texas A&M AgriLife Research	Department of Homeland Security Center of Excellence for Cross-Border Threat Screening and Supply Chain Defense (CBTS)	Texas A&M Institute for Infectious Animal Diseases (IIAD)

Federal support can bolster efforts to secure food and agricultural systems.

Navigating potential crises: Global supplier substitutions

During times of crisis that disrupt global supply chains — as with the COVID-19 pandemic and the Russian war in the Ukraine — U.S. producers suffer supply disruption through scarcer and pricier critical inputs and operation costs. A Russian shut-off of natural gas to Europe, for example, could signal a price increase for U.S. producers and consumers as U.S. gas is diverted. What is the potential for substitute suppliers during these times?

Investment opportunities

Texas A&M AgriLife brings the technical expertise and public-private relationships to develop digital tools that model the potential for supplier substitutions through comprehensive analysis including:

- Factors that contribute to supply chain substitution potential
- The potential for restoring supply chain activities
- Potential costs and supply chain risks to supplier substitution

Texas should lead these endeavors

As the top exporting state in the U.S., Texas' ability to lead major initiatives in securing national food supplies hinges on a range of competitive advantages.

29 ports of global trade entry to Texas: Air, land and sea

$650 billion in annual trade taking place at Texas ports of entry

$6.3 billion in annual agricultural exports

1,250 miles of international border with Mexico

360 miles of coastline along the Texas gulf Coast

TEXAS A&M AgriLife RESEARCH

Strengthening emerging-risk assessment: Company stewardship

As the firms who lead global supply chains invest in their companies, we must understand the impact of those investments on the resilience of food and agricultural supply chains. Our ability to shorten supply chains hinges on quick identification and engagement of alternative suppliers. Working with industry is critical to building this ability. We must learn their unique methods of assessing market opportunity and risk, and their decision-making practices. This process relies on understanding many interconnected factors that determine viable supplier substitutes.

Investment opportunities

- Advance research and analysis to assess the effects of company stewardship decisions on food supply chains.
- Examine the dynamic nature of firms across world markets and geographies.

Detecting and offsetting biothreats

In conducting supply chain activities whose far-reaching impacts can be difficult to estimate, advances in science and development of smart new tools must take place to detect and offset biothreats to U.S. and global food systems. The integration of physical and information systems into a universal platform would help to test future trade data systems and would assist rapid sharing of information with government partners. Integrating these systems would allow for simultaneous tests of targeting, detection, mitigation and response actions.

Investment opportunities

- Develop digital tools at an applicable scale to account for cargo and passengers.
- Develop tools in a facility dedicated to testing, research and instruction at the Texas A&M-RELLIS campus.

Building a forum to discuss vulnerabilities and solutions

For entities interested in strengthening food and agricultural supply chains, discussions must take place about vulnerabilities while avoiding those who might seek opportunities to exploit weaknesses. Texas A&M AgriLife Research is uniquely positioned to lead the creation of a forum in which policymakers, business leaders and analysts can share information and collaborate to solve supply chain vulnerabilities. These efforts will examine how artificial intelligence can be used to assess risks across selected supply chains. Innovations would minimize disruptions and facilitate economic growth and social welfare.

Investment opportunities

- Transfer existing Texas A&M AgriLife Research data related to business entity risks.
- Examine risk reduction benefits across supply chains.
- Understand national benefits of risk mitigation investments.

TEXAS A&M
AgriLife
RESEARCH