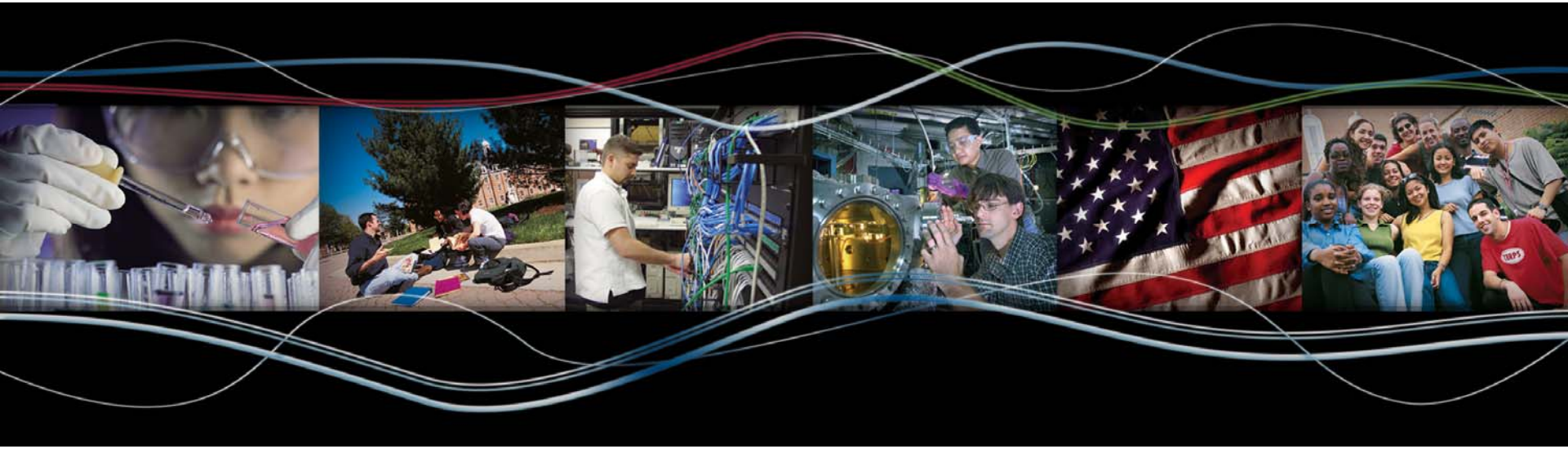
The DHS Centers of Excellence



Science and Technology Directorate

University Programs Brief to Appropriations

Homeland Security

Center of Excellence Contributions to DHS Science and Technology Division Missions

DHS University Network Summit on Research and Education

FAZD CENTER

National Center for Foreign Animal and Zoonotic Disease Defense

National Center for Foreign Animal and Zoonotic Disease Defense

March 15, 2007

FAZD CENTER
National Center for Foreign Animal and Zoonotic Disease Defense

National Center for Foreign Animal and Zoonotic Disease Defense

Core Partners

UC DAVIS University of California, Davis

Texas A&M University

USC University of Southern California

UTMB The University of Texas Medical Branch

Associate Partners

University of Minnesota

University of Maryland

The University of Wisconsin Madison

National Partners

Los Alamos National Laboratory Est. 1943

Lawrence Livermore National Laboratory
Science in the National Interest

Sandia National Laboratories

Pacific Northwest National Laboratory
...delivering breakthrough science and technology

Plum Island Animal Disease Center

State Partners

Texas Animal Health Commission — Serving Texas Animal Agriculture — Since 1893

cdfa California Department of Food & Agriculture

Centers of Excellence

CREATE Homeland Security Center

National Center for Food Protection and Defense
A Homeland Security Center of Excellence

FAZD CENTER
National Center for Foreign Animal and Zoonotic Disease Defense

Three Themes

Biological Systems ***BioSys***

- Detection & Diagnostics
- Host-Pathogen Interactions
- Disease Surveillance
- Functional Genomics
- Pathogenesis

Information Analysis Systems ***IMA***

- Threat Assessment
- Transportation Modeling
- Risk Analysis
- Spatial Science
- Economics Modeling
- Epidemiology
- Integrated Models

Education and Outreach

- Undergraduate
- Advanced degree
- Post graduate professional
- Commodity-specific
- Private Sector
- HLS Operators – Gov't
- Lender, insurer, consultant

FROM SCIENCE...SECURITY

Situation

- Food and agriculture provide almost 13% of jobs in the U.S. with an annual economic activity approaching $1 trillion per year.
- Nine out of 10 highest priority human threat agents are diseases transmitted from animals (zoonoses).

FAZD CENTER

National Center for Foreign Animal and Zoonotic Disease Defense

Homeland Security Presidential Directive/HSPD 9

"The United States agriculture and food systems are vulnerable to disease, pest, or poisonous agents that occur naturally, are unintentionally introduced, or are intentionally delivered by acts of terrorism. America's agriculture and food system is an extensive, open, interconnected, diverse, and complex structure providing potential targets for terrorist attacks. We should provide the best protection possible against a successful attack on the United States agriculture and food system, which could have catastrophic health and economic effects."

Major Operational Needs

Prevention	Detection	Response	Recovery

Foot and Mouth Disease

Threat

- Most contagious viral disease
- Highly susceptible for multiple livestock and wildlife species
- Multi-billion dollar impact

Products

- Rapid portable tests for detection
- Antiviral agents for immediate protection
- Quantitative models for threat/ vulnerability

Avian Influenza

Threat

- Highly pathogenic H5N1 — importation and possible mutation to human pandemic
- Transmission among species
- Economic and public health consequences

Products

- Define relationship between birds and humans for transmission
- Vaccines/antiviral agents for prevention
- New methods for rapid detection

Rift Valley Fever

Threat

- Contagious viral disease transmitted between animal and man
- Mortality and abortion in animals, acute flu like symptoms in man
- Insect hosts present in U.S.

Products

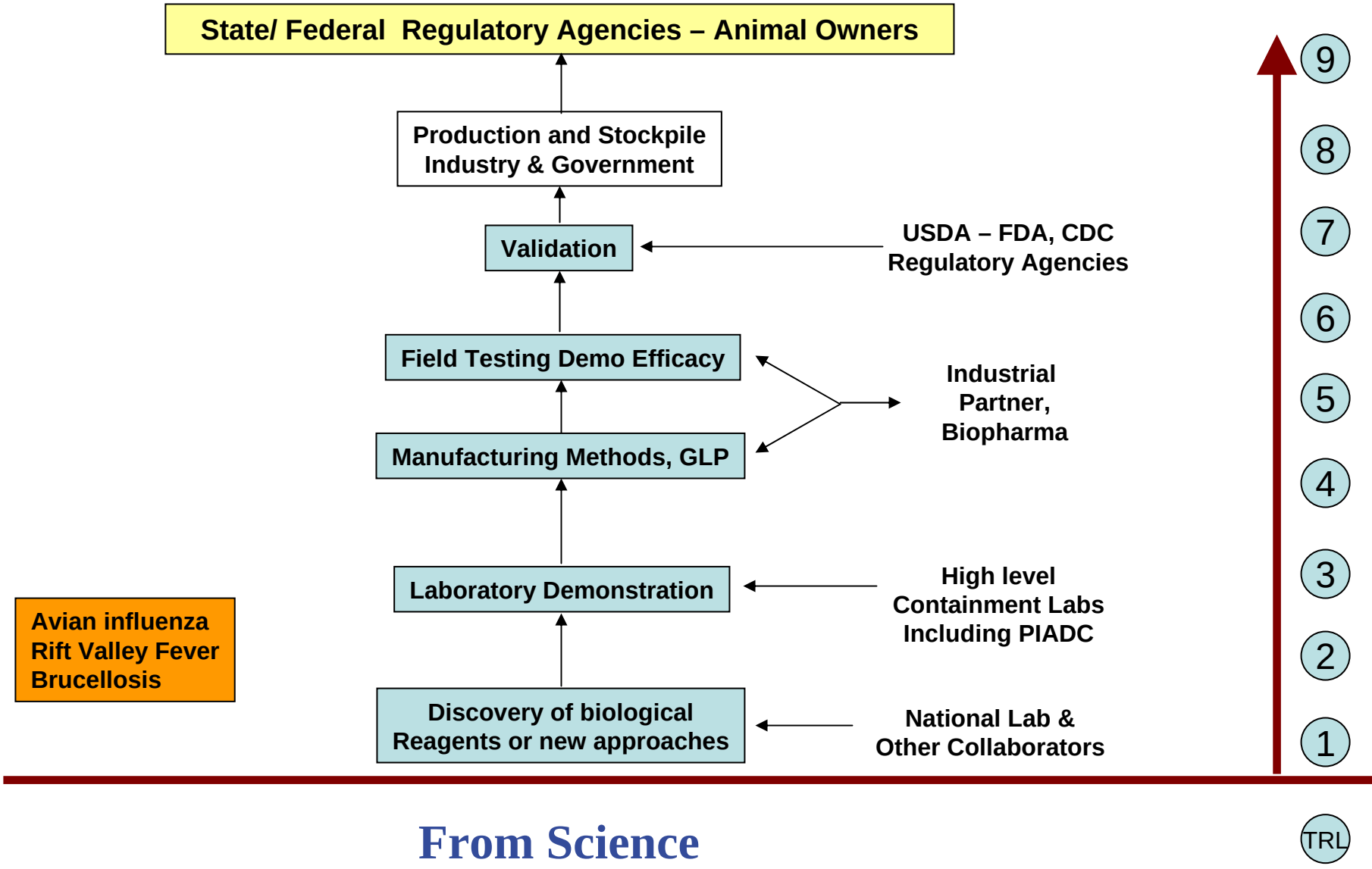
- Animal vaccine reagents
- Early detection/diagnostic tools
- Quantitative models of disease for prevention and management strategies

FAZD Center products defend against both naturally occuring and intentionally introduced diseases and contribute explicitly to the national goal of an all-emergencies response

Lead institution Texas A&M University | **Core members** The University of California, Davis | The University of Southern California | The University of Texas Medical Branch

FAZD CENTER VACCINE DEVELOPMENT

To Security



From Science

DHS S&T Directorate: Alignment for Success

DHS S&T Divisions: Customers and Portfolios

Customers	Detect & Defend Against WMD		National Culture of Preparedness	Control Our Borders	Strengthen Screening of Travelers	Secure Critical Infrastructure
	Department of Justice Federal Law Enforcement Training Center Transportation Security Administration Customs & Border Protection Federal Emergency Management Administration U.S. Secret Service U.S. Coast Guard	Department of Agriculture Department of HHS Department of Justice DHS CMO Federal Law Enforcement Training Center Transportation Security Administration Customs & Border Protection Federal Emergency Management Administration U.S. Secret Service U.S. Coast Guard	AS Cyber and Telecommunications Department of Justice DHS Office of Intelligence and Analysis Enforcement Federal Law Enforcement Training Citizenship & Immigration Services Customs & Border Protection State/Local Police U.S. Coast Guard FEMA	Customs & Border Protection Transportation Security Administration Citizenship & Immigration Services U.S. Secret Service U.S. Coast Guard ICE	AS Grants & Training Federal Law Enforcement Training Center Director of Counternarcotics Transportation Security Administration Customs & Border Protection Citizenship & Immigration Services U.S. Secret Service U.S. Coast Guard ICE	AS Infrastructure Protection Department of Justice Transportation Security Administration Customs & Border Protection Federal Emergency Management Administration U.S. Secret Service U.S. Coast Guard FEMA
	Energetics	**Chem/ Bio**	**C4ISR**	**Borders/ Maritime**	**Human Factors**	**Infrastructure/ Geophysical**
Awareness						
Prevention	Transportation Security Program Counter-MANPADS	Chem/Bio R&D Chem/Bio Transition to Ops Agro-Defense	Interoperability and Compatibility State/Local Preparedness & Response Cyber & Information Security Threat Characterization Joint Risk Assessment	Border Security Program	Psychology of Terrorism, human response, etc. Immigration Enforcement & Reform Program	Critical Infrastructure Protection
Protection						
Response						
Recovery						

FY 2007 S&T Director Program Structure

Director of Research
$50.5M

DHS Centers $36.4M

- Center 1
- Center 2
- Center 3
- Center 4
- Cooperative Center 1
- Cooperative Center 2
- INC Coordinating Research Initiatives
- Program Mgmt, Performanceand Evaluation
- Center 5
- Center 6
- Center 7

ONL

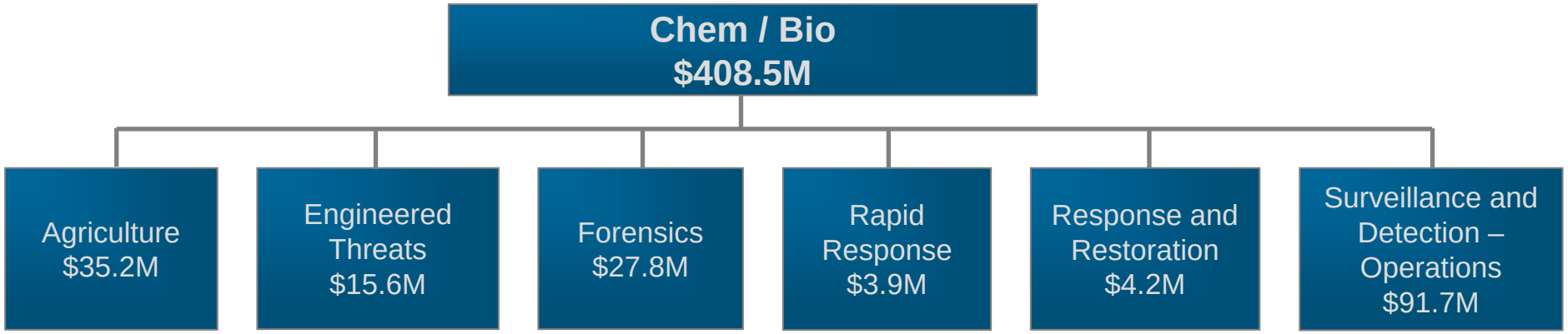
- NBACC Const
- NBAF
- EML O&M
- PIADC O&M
- RNCTEC Const

Fellowships $14.1M

- AAAS Fellows Program
- Scholarships & Fellowships
- Summer Research Team Program for MSI

Homeland Security

FY 2007 S&T Division Program Structure



- FAD Modeling
- FAD Vaccine & Countermeasure Development
- Joint Agro Defense Office (JADO)
- Plum Island Animal Disease Center (PIADC) Upgrades

- Detection of Unknowns
- Engineered Threat Prioritization

- Bio Forensics Research and Development
- Bioforensics Operations (NBFAC)

- Rapid Response

- Operational Tools for Response and Restoration
- Systems Approaches for Restoration

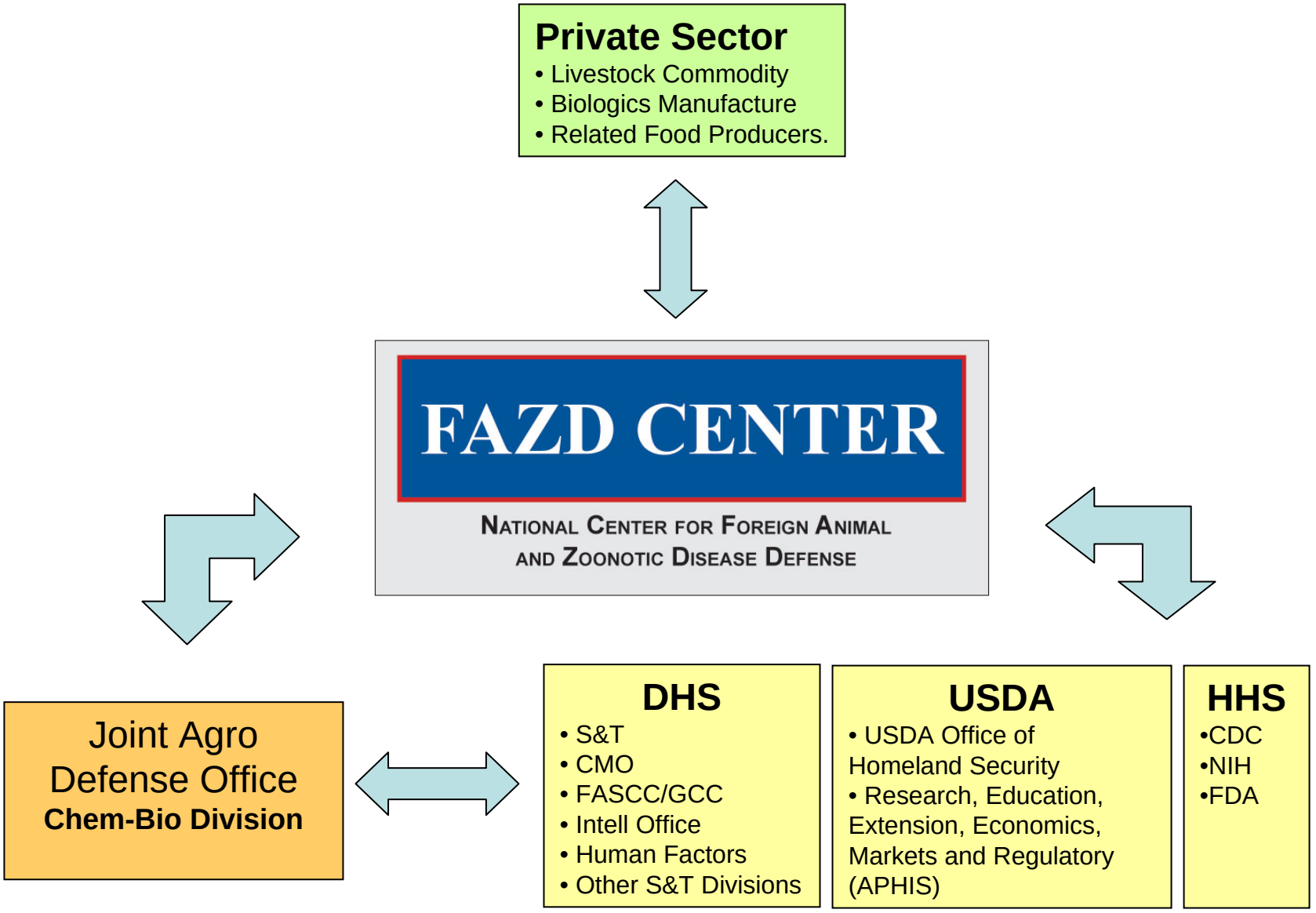
- Biological Warning & Incident Characterization
- BioWatch

Homeland Security

Preparedness & Response Continuum

- ID Critical Infrastructure Components
- Assess **Vulnerabilities**
- Assess Threats & Risk
- Develop Protective Measures & Mitigation Strategies
- Priorities Protective Measures
- Implement Protective Measures
- R&D

- Plan & Train (CDP)
- Implement Response Plans
- Monitor Infrastructures
- Assess Response Capability
- Contain Impact/Effect
- Implement Mitigation
- Recovery
- Return to Normalcy

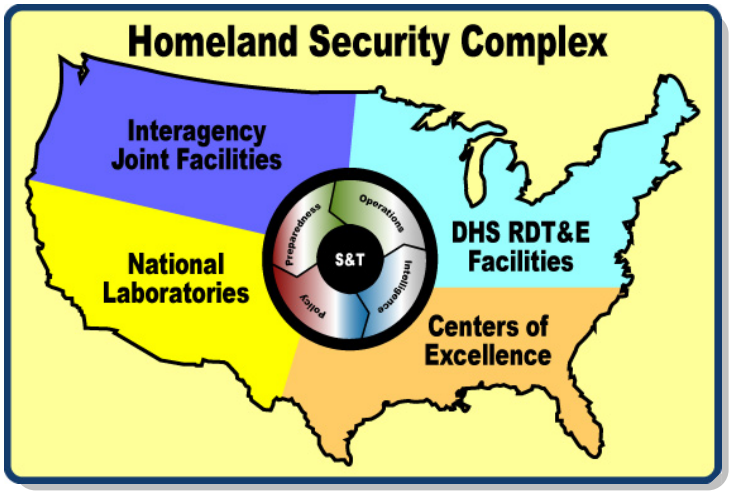

Private Sector
• Livestock Commodity
• Biologics Manufacture
• Related Food Producers.
FAZD CENTER
National Center for Foreign Animal and Zoonotic Disease Defense
Joint Agro Defense Office
Chem-Bio Division
DHS
• S&T
• CMO
• FASCC/GCC
• Intell Office
• Human Factors
• Other S&T Divisions
USDA
• USDA Office of Homeland Security
• Research, Education, Extension, Economics, Markets and Regulatory (APHIS)
HHS
•CDC
•NIH
•FDA

FAZD CENTER
National Center for Foreign Animal and Zoonotic Disease Defense

Customers and Products

Customer	Product
Food and Agriculture Industries	Protection, planning, education, response
Policy/Decision Makers	Quantitative decision tools at multiple levels
DHS – ODP	Threat and vulnerability assessments NIPP
DHS – NBACC	Threat assessment
DHS Ports and Borders	Surveillance and detection for FAZD
APHIS	Databases, models, decision support system support and consequence management
CDC	Zoonoses- vulnerability assessment and consequence management
Intelligence Community	Assessments, requirements, analysis
Economic Research Service	Databases and GIS based animal transportation models
NBACC – LLNL	Agricultural component of the Biodefense Knowledge Center
Department of Defense	Biological products and impact assessment for zoonoses affecting war fighter
State Emergency Planning	Engagement at state levels in California and Texas – models for other states

Within the Homeland Security Complex



National Laboratories:

LLNL	BKC and Bioinformatics Research- Academic Network FAZD
LANL	Threat Assessment for Agriculture
SNL	Bioinformatics on threat agents
PNNL	Functional genomics, consequence modeling

DHS RDT&E Facilities:

PIADC	Biological research on FMD & CBPP
NBACC	Threat Assessment and SME for Agriculture
HSARPA	Risk Symposium at FAZD Center

Centers of Excellence:

CREATE	Economics and Risk Assessment
NCFPD	Economics, Biosensors, Education & Outreach (Web-based)

USDA:

NVSL *(Natn'l Vet. Services Laboratory)*	Validation of new tests and vaccines
ARS *(Agricultural Research Service)*	FMD, CBPP, AI
CEAH *(Centers for Epidemiology & Animal Health)*	Integrated models for FAZD
ERS *(Economic Research Service)*	Transportation and economic impact
CSREES *(NRI)*	AI

FROM SCIENCE...SECURITY

FAZD CENTER

National Center for Foreign Animal and Zoonotic Disease Defense

Products to defend America's health and economy from engineered and exotic animal diseases

Focused currently on threats posed by 3 diseases exotic to the United States

Each could be engineered for intentional use against the public health or the national economy

Foot and Mouth Disease
- Most contagious viral disease
- Highly susceptible for multiple species of livestock and wildlife
- Multi-billion dollar impact on U.S. economy
- 2001 UK outbreak: $11.75 billion

Avian Influenza
- Highly pathogenic H5N1
- Importation and possible mutation to human pandemic
- Transmission among species
- Economic and public health consequences

Rift Valley Fever
- Contagious viral disease transmitted between animal and man
- Mortality and abortion in animals
- Acute flu like symptoms in man
- Insect hosts are already present in the U.S.

To combat these threats, FAZD Center generates a stream of products that explicitly address DHS priorities

Biological Systems
Satisfy DHS goals of detection, diagnosis, prevention and recovery

Vaccines and Antiviral Agents
- State of the art vaccine candidates to protect livestock, poultry, and humans
- Immune system modulators to reduce time between immunization and onset of protective immunity

Detection/Diagnostic Technologies
- Rapid 'pen side' or 'chute side' tests
- High throughput, 'surge' capacity robotic assays
- Real-time PCR assays for improved sensitivity and agent subtyping

Universal Platforms for Advanced Agent and Disease Profiling
- Molecular signature archives of disease states to derive improved diagnostic and therapeutic capabilities

Informatics Analysis Systems
Better informed decision making at multiple levels of scale

Epidemiologic Modeling
- Analyses of impact of FMD incursion in California and Texas High Plains
- Marketing/transportation model addresses impact of livestock movement on spread of disease

Analysis and Information
- Computer program developed to enable national model integration
- Collaborative grid computing system has been established between universities

Economic Modeling and Risk Analysis
- Economic consequences of disease outbreaks and prevention, intervention, and recovery strategies
- Modeled the links between compensation for losses and disease management, price, consumer demand, and international trade adjustments

Education and Outreach
Provide the next generation of science power for homeland security

Avian Influenza School
- For extension agents, veterinarians, researchers and farmers in California, Texas, Minnesota and Africa
- Scenarios: Small poultry operations, live bird markets, commerical facilities and wildlife refuges

Mass Mortality Workshops
- For producers, government agencies, scientists and commodity associations in California and Texas
- Examined impact of proper disposal following disasters affecting livestock industry

Training in Emerging Diseases
- Trained first responders, industry workers, 350 County Extension Agents

Masters in Veterinary Health
- Extended graduate programs at University of California, Davis and Texas A&M University

FAZD Center products defend against both intentionally introduced and naturally occuring diseases and contribute explicitly to the national goal of an all-emergencies response

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