



# Background and Development of the National Bio and Agro-defense Facility

presented by

**Dr. Ron W. Trewyn**

National Bio and Agro-defense Facility Liaison from the Office of the President of Kansas State University

Hosted by

**KANSAS STATE**  
UNIVERSITY



Command and General  
Staff College Foundation, Inc.





# NATIONAL BIO AND AGRO-DEFENSE FACILITY

Protecting America from Deadly Diseases  
Arter-Rowland National Security Forum  
September 23, 2020

**Ron Trewyn**  
Kansas State University  
NBAF Liaison

[trewyn@ksu.edu](mailto:trewyn@ksu.edu); [www.ksu.edu/NBAF](http://www.ksu.edu/NBAF)







# NATIONAL BIO & AGRO-DEFENSE FACILITY

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**

## State-of-the-Art Foreign Animal Disease Lab

**NBAF**  
in Kansas  
*Hits the Mission Bull's-eye!*



*\*And to Safeguard People from Pandemic Threats Caused by Zoonotic Foreign Animal Diseases*

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# NATIONAL BIO & AGRO-DEFENSE FACILITY

To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\*

## State-of-the-Art Foreign Animal Disease Lab

**NBAF**  
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*Hits the Mission Bull's-eye!*



**MISSION: To Protect U.S. Livestock from  
Foreign Animal Diseases (FADs)  
Including Zoonotic (Animals ⇌ People) FADs**

- ☐ To Safeguard Food Animal Health & Public Health
  - ☐ To Preserve America's Food Supply & Ag Economy
- DHS/USDA FADs on the NBAF List in 2017

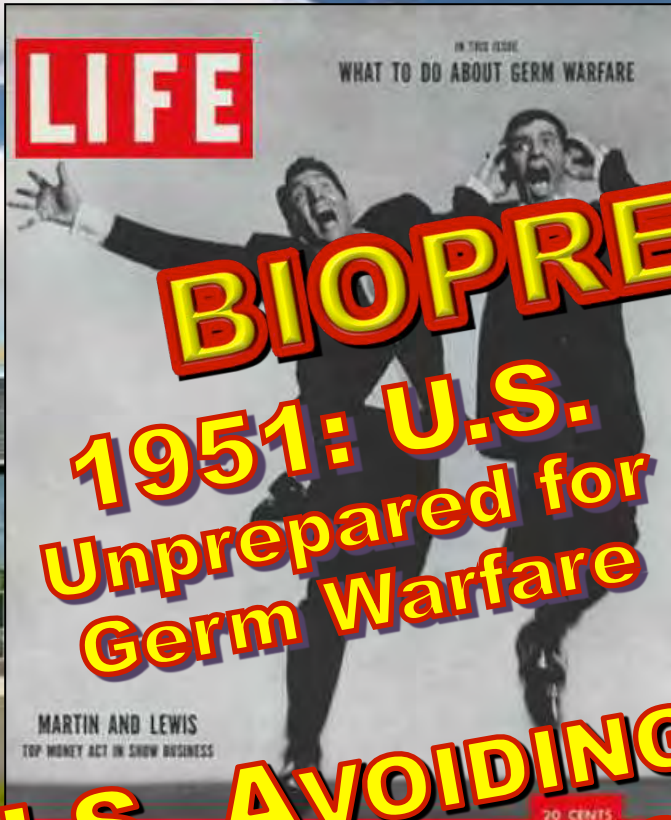


- LIVESTOCK ONLY: *African Swine Fever (ASF); Classical Swine Fever (CSF); FOOT AND MOUTH DISEASE (FMD)\**
- ZOONOTIC: *Rift Valley Fever (RVF); Japanese Encephalitis (JE); NIPAH VIRUS;\* EBOLA VIRUS\*\**

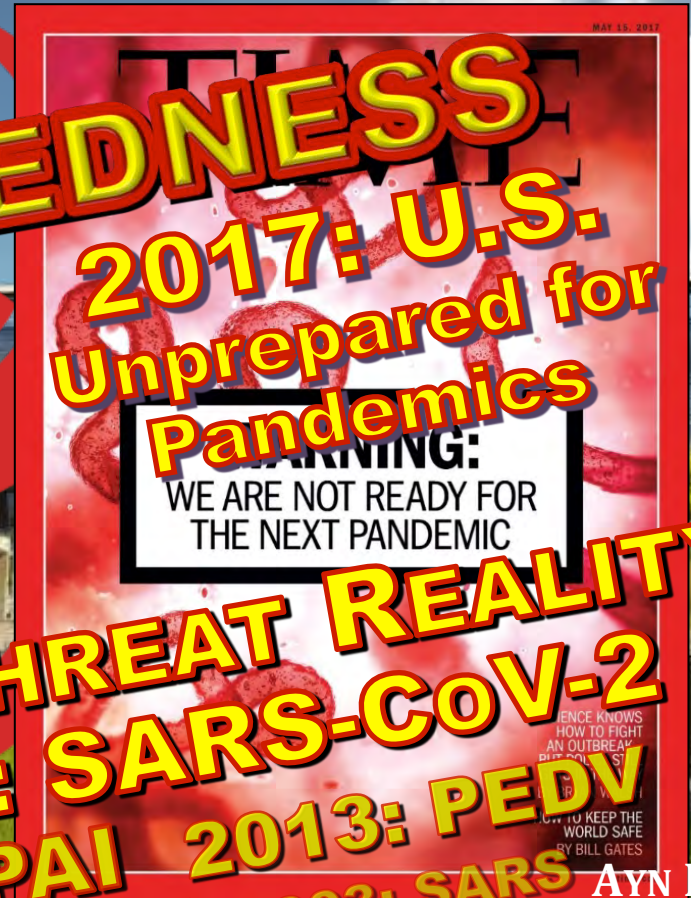


*\*And to Safeguard People from Pandemic Threats Caused by Zoonotic Foreign Animal Diseases*





**1951: U.S.  
Unprepared for  
Germ Warfare**



**2017: U.S.  
Unprepared for  
Pandemics**

**U.S. AVOIDING BIOTHREAT REALITY**  
**2020 CONSEQUENCE: SARS-CoV-2**  
**2014/15: HPAI 2013: PEDV**  
**2009: H1N1 2003: SARS**  
**2001: Anthrax Letters 1918 Spanish Flu**

AYN RAND

*"You can avoid reality, but you cannot avoid  
the consequences of avoiding reality."*





# GLOBAL BIOTHREATS OF U.S. CONCERN

# ONLY Path

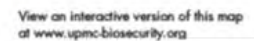
**FROM: K.J. Rambhia,  
A.S. Ribner and G.K.  
Gronvall; Biosecurity  
and Bioterrorism:  
Biodefense Strategy,  
Practice and Science,  
9(1): 69-71, 2011.**



***\*And to Safeguard People from Zoonotic Animal Diseases and Foodborne Pathogens***

**51} Eight (8) on the 1951 “LIFE” germ warfare list of 16**

**01/01/09  
TO  
10/31/10**





# Terrorist



## GLOBAL BIOTHRREATS OF U.S. CONCERN



To Protect American Agriculture — Crops, Livestock — and Food from Global Biothreats\*

### Bioweapons Pursued by al-Qaeda

Handwritten notes listing various pathogens and their effects, including Plague, Anthrax, Glanders, Cholera, Tularemia, and Botulism. A red circle highlights the text: "List found in 2002 by U.S. Navy SEALs in a cave in Afghanistan".

### Methods in 2002

Handwritten notes detailing methods for bioweapons production, including "MAN POWER", "TECHNICAL", "INFORMATION", "VACCINATED", "TARGET", and "FEEDING". A red circle highlights the text: "Plus, 2-3 years later, photos were taken of al-Qaeda experimenting on animals: THESE THREATS ARE REAL!".

Also in the cave

### 2002 List Details

#### ANTI-PERSONNEL

DISEASE	PATHOGEN	ONSET	MORTALITY	ROUTE
51} Plague	<i>Pasturella pestis</i>	3-4 Days	35-100%	Aerosol
Anthrax	<i>Bacillus anthracis</i>	1-4 Days	95-100%	Aerosol
Glanders	<i>Actinobacillus</i>		95-100%	Aerosol
Cholera	<i>Vibrio cholera</i>		10-20%	Water
51} Tularemia	<i>tularensis</i>	2-5 Days	0-60%	Aerosol
51} Psittacosis	<i>C. psittaci</i>		75-100%	Tick

#### ANTI-ANIMALS

51} Foot and Mouth Disease		
51} Rinderpest Cattle Plague		
51} Newcastle		
51} Hog Cholera		
51} Fowl Plague		
Aspergillosis		

#### ANTI-PLANTS

Rice Blast	
Maize Rust	51}
Black Stem Rust of Cereals	51}
Rice Blight	

Eradicated worldwide by 2011

a.k.a., Classical swine fever

### Schematic outlining bioweapons production





# U.S. BIO / AGRODEFENSE POLICY Pandemic? Policies Established. No Sweat!

GEORGE  
ARMSTRONG  
CUSTER



*"There are not enough Indians in the world  
to defeat the Seventh Calvary." No sweat!*





# U.S. BIO/AGRODEFENSE PUBLIC POLICY

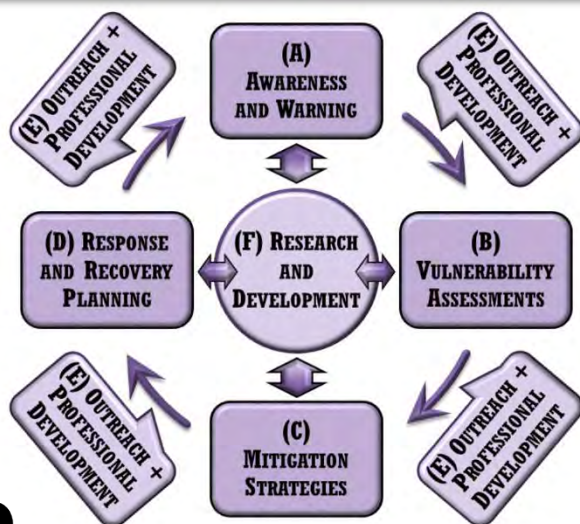


*To Protect American Agriculture — Crops, Livestock — and Food from Global Biothreats\**

## Homeland Security Presidential Directive-9 — HSPD-9<sup>(1)</sup> —

**JANUARY 30, 2004**

### BIO/AGRODEFENSE ESSENTIALS



- A. AWARENESS AND WARNING: Exploit Crop, Livestock, and Food Biothreat Intelligence
- B. VULNERABILITY ASSESSMENTS: Evaluate Crop, Livestock, and Food Susceptibility to Biothreats
- C. MITIGATION STRATEGIES: Establish Policies/Procedures/Screening to Reduce Vulnerabilities
- D. RESPONSE AND RECOVERY PLANNING: Implement Tactics to Recover from Outbreaks
- E. OUTREACH AND PROFESSIONAL DEVELOPMENT: Inform, Educate, and Train Stakeholders
- F. RESEARCH AND DEVELOPMENT: Advance New Countermeasures to Safeguard Agriculture<sup>(2)</sup>

*\*And to Safeguard People from Zoonotic Animal Diseases and Foodborne Pathogens*



# U.S. BIO/AGRODEFENSE READINESS

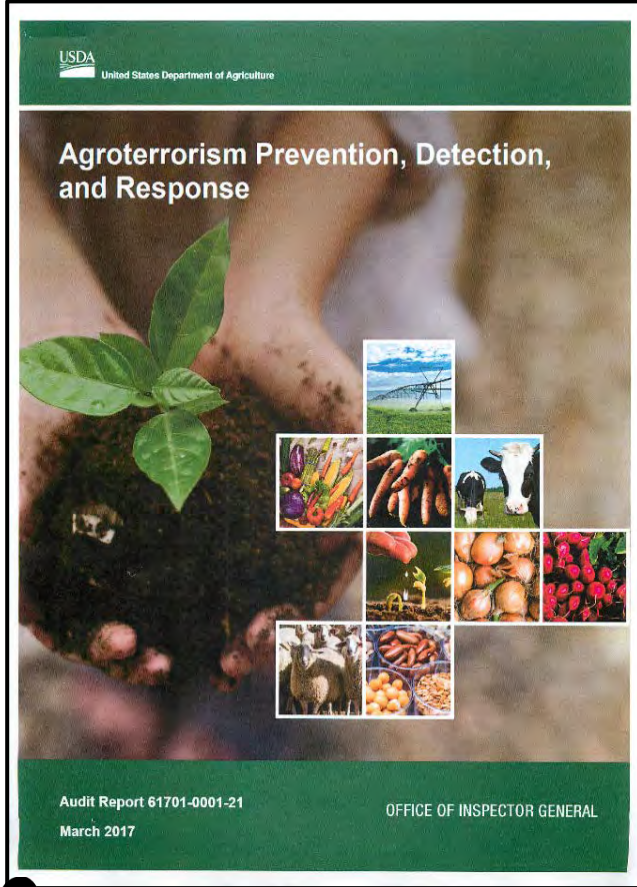


To Protect American Agriculture — Crops, Livestock — and Food from Global Biothreats\*



## Agroterrorism Prevention, Detection and Response

MARCH 2017



### USDA OFFICE OF HOMELAND SECURITY AND EMERGENCY COORDINATION (OHSEC)

- ☐ **Lacked Oversight of USDA's Agroterrorism Preparedness**
  - No documented process
  - Vulnerability not assessed
  - No response plans
- ☐ **Lacked Evidence of Compliance with HSPD-9**
  - Agency responses not evaluated/validated
  - Performance measures never implemented

**F**

\*And to Safeguard People from Zoonotic Animal Diseases and Foodborne Pathogens





# U.S. BIO/AGRODEFENSE PUBLIC POLICY

*To Protect American Agriculture — Crops, Livestock — and Food from Global Biothreats\**

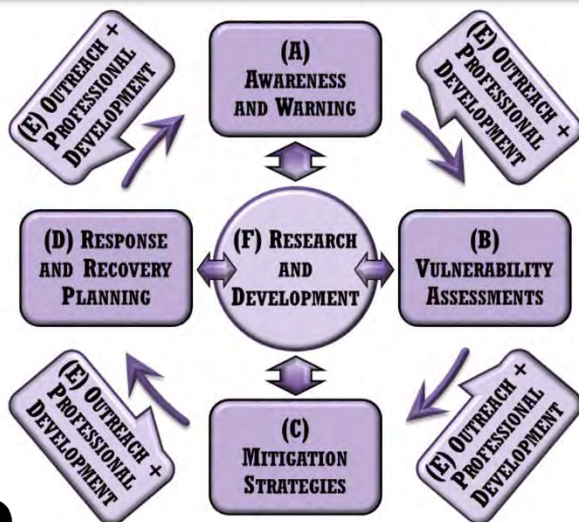


## Securing our Agriculture and Food Act

— Public Law 115-43 —

**JUNE 30, 2017**

### BIO/AGRODEFENSE ESSENTIALS



## AMENDED: 2002 Homeland Security Act

- ☐ **MANDATE:** "... coordinate (DHS's) efforts related to defending the food, agriculture, and veterinary systems of the United States against terrorism and other high-consequence events that pose a high risk to homeland security."
- ☐ **REQUIREMENT:** Provide oversight and management of DHS responsibilities pursuant to HSPD-9 that involve Lead or Co-Lead duties in each of the essentials shown to the left [(A) through (F)].



*\*And to Safeguard People from Zoonotic Animal Diseases and Foodborne Pathogens*



# U.S. BIO/AGRODEFENSE READINESS



*To Protect American Agriculture — Crops, Livestock — and Food from Global Biothreats\**

OFFICE OF INSPECTOR GENERAL

DHS Is Not Coordinating the Department's Efforts to Defend the Nation's Food, Agriculture, and Veterinary Systems against Terrorism



July 16, 2020  
OIG-20-53



OFFICE OF  
INSPECTOR  
GENERAL

## Securing our Agriculture and Food Act (SAFA)

JULY 16 2020

### DHS COUNTERING WEAPONS OF MASS DESTRUCTION (CWMD) OFFICE

- ☐ ***Has Not Carried Out a Program to Manage DHS HSPD-9 Responsibilities***
  - *No documented process*
  - *No tracking mechanism*
  - *No implementation plans*
- ☐ ***Has Failed to Lead SAFA Policy Requirements***
  - *No policies have been developed*
  - *No coordination with Federal partners*

**F**

*\*And to Safeguard People from Zoonotic Animal Diseases and Foodborne Pathogens*



**HITTING THE MISSION BULL'S-EYE**  
**Aiming Helps ...**  
**Thinking Helps Too!**

*"If everyone is thinking alike,  
then somebody isn't thinking."*

**GEORGE S.  
PATTON**



# U.S. Bio/Agrodefense



## HITTING THE MISSION BULL'S-EYE: KANSAS STATE UNIVERSITY

Protecting American Agriculture — Crops, Livestock — and Food from Global Biothreats\*



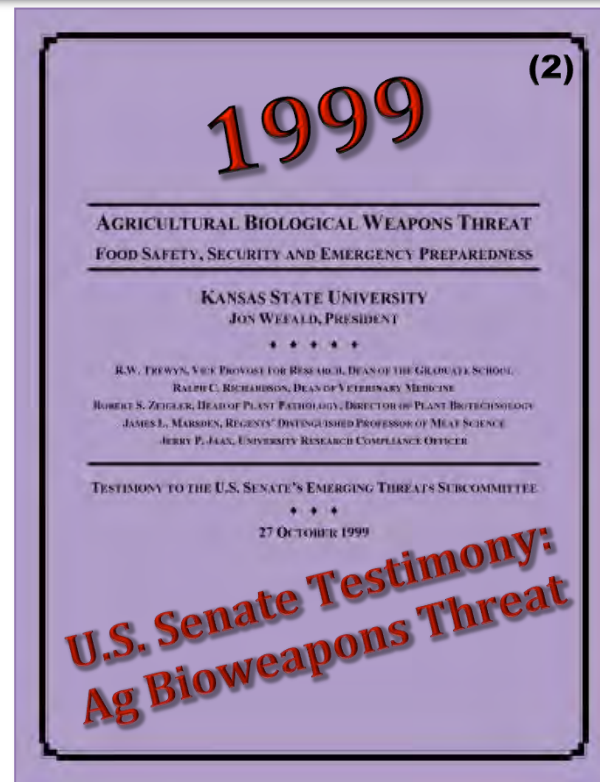
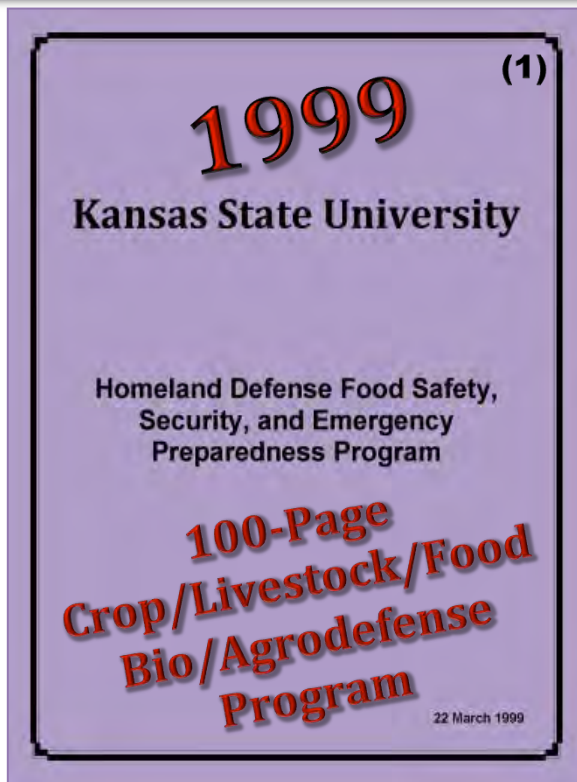
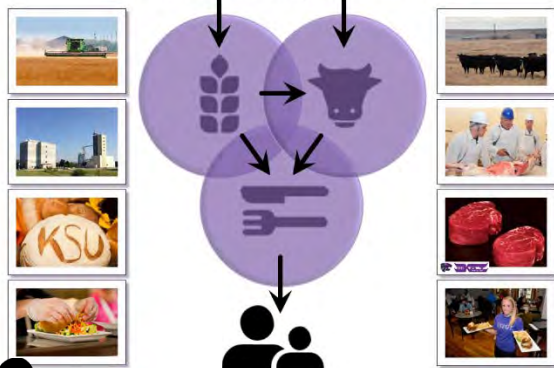
### Vigilance Pre-9/11

U.S. Agriculture's  
1<sup>st</sup> First Responder

**NBAF**  
in Kansas

Hits the Mission Bull's-eye!

PATHOGENS/TOXINS



Outlined comprehensive approaches to safeguard America's crops, livestock, food and people from naturally occurring infectious diseases and terrorist-delivered bioweapons

\*While Safeguarding People from Zoonotic Animal Diseases and Foodborne Pathogens



# U.S. Bio/Agrodefense



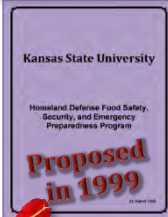
## HITTING THE MISSION BULL'S-EYE: KANSAS STATE UNIVERSITY

Protecting American Agriculture — Crops, Livestock — and Food from Global Biothreats\*



### Biosecurity Research Institute

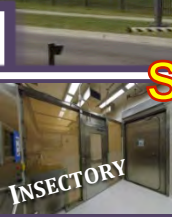
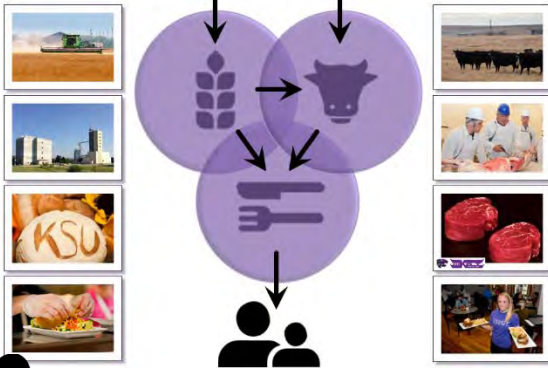
Constructed 2004-07



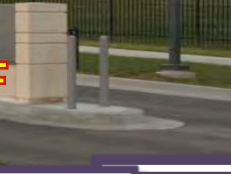
### NBAF in Kansas

Hits the Mission Bull's-eye!

#### PATHOGENS/TOXINS



CAN JUMP-START NBAF RESEARCH



BSL-3E CROP PATHOGEN R&D

BSL-3Ag LIVESTOCK DISEASE R&D

BSL-3/3E FOOD SAFETY R&D

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KANSAS STATE UNIVERSITY

NBAF DISEASES



2013/14: Rift Valley Fever (32); Japanese Encephalitis (10)  
2015/16: Classical Swine Fever (16); African Swine Fever (36)

# U.S. Bio/Agrodefense



## HITTING THE MISSION BULL'S-EYE = WINNING!

Protecting American Agriculture — Crops, Livestock — and Food from Global Biothreats\*

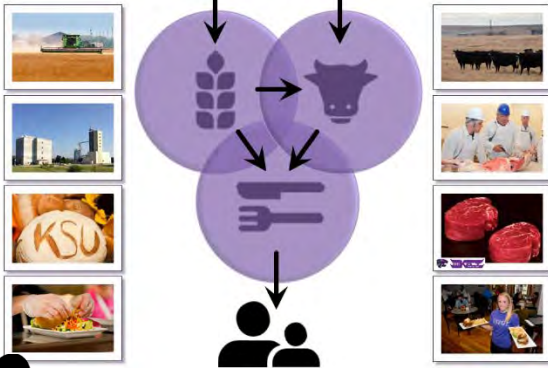


→ **Manhattan, KS** ←

**NBAF**  
in Kansas

Hits the Mission Bull's-eye!

**PATHOGENS/TOXINS**



Finalists from 29 Submissions for 34 Sites after 17 Site Visits

**KS\*** **TX** **GA** **MS** **NC** **NY**

	KS*	TX	GA	MS	NC	NY
	LIVESTOCK RESEARCH (THE #1 PRIORITY)					
	AVAILABLE WORKFORCE					
SITE-SPECIFIC	ACQUISITION/CONSTRUCTION/OPERATIONS					
	PUBLIC SUPPORT					
	THREAT AND RISK ASSESSMENT					
	15-MONTH ENVIRONMENTAL ASSESSMENT					
	Manhattan <b>#1</b>	#2 San Antonio	#3 Athens	Flora <b>UNACCEPTABLE</b>	Butner	Plum Island

**\*While Safeguarding People from Zoonotic Animal Diseases and Foodborne Pathogens**

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MEETS CRITERIA PARTIALLY MEETS CRITERIA FAILS TO MEET CRITERIA

\* DHS SELECTION MEMO: MANHATTAN, KS, "Best met the purpose and need."



# STATUS QUO REPLACEMENT FUNDING

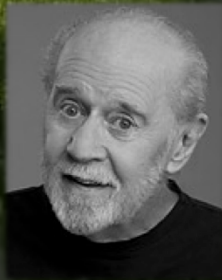
Plum Island

"The status quo <sup>o</sup> SUCKS!"

NBAF is needed NOW!!!

(And that was before George died)

GEORGE  
CARLIN



# CONSTRUCTION COST: \$1,250,300,000

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**

## FINAL FUNDING SUMMARY

SOURCE OF FUNDS	FY 2006-13	FY 2014	FY 2015	TOTAL
Federal Appropriations	\$234.3 Million	\$404 Million	\$300 Million <sup>(3)</sup>	\$938.3 Million
State of Kansas	\$105 Million <sup>(1)</sup>	\$202 Million <sup>(2)</sup>	---	\$307 Million
City of Manhattan	\$5 Million <sup>(1)</sup>	---	---	\$5 Million
<b>TOTAL</b>	<b>\$344 Million</b>	<b>\$606 Million</b>	<b>\$300 Million</b>	<b><u>\$1.25 BILLION</u></b>

<sup>(1)</sup> Commitment in the "Kansas Final Site Offer" for NBAF, March 31, 2008;<sup>8</sup>

<sup>(2)</sup> Committed to match the federal \$404M when the last \$300M funded; transferred April 15, 2015

<sup>(3)</sup> Passed by the U.S. Senate, February 27, 2015; by the U.S. House, March 03, 2015; and

Signed by the President, March 04, 2015; Lab Construction Required Full Funding

*\*And to Safeguard People from Pandemic Threats Caused by Zoonotic Foreign Animal Diseases*



**CONSTRUCTION PROGRESS TO DATE**  
**And the Results Are?**

*"However beautiful the strategy,  
you should occasionally look at the results."*

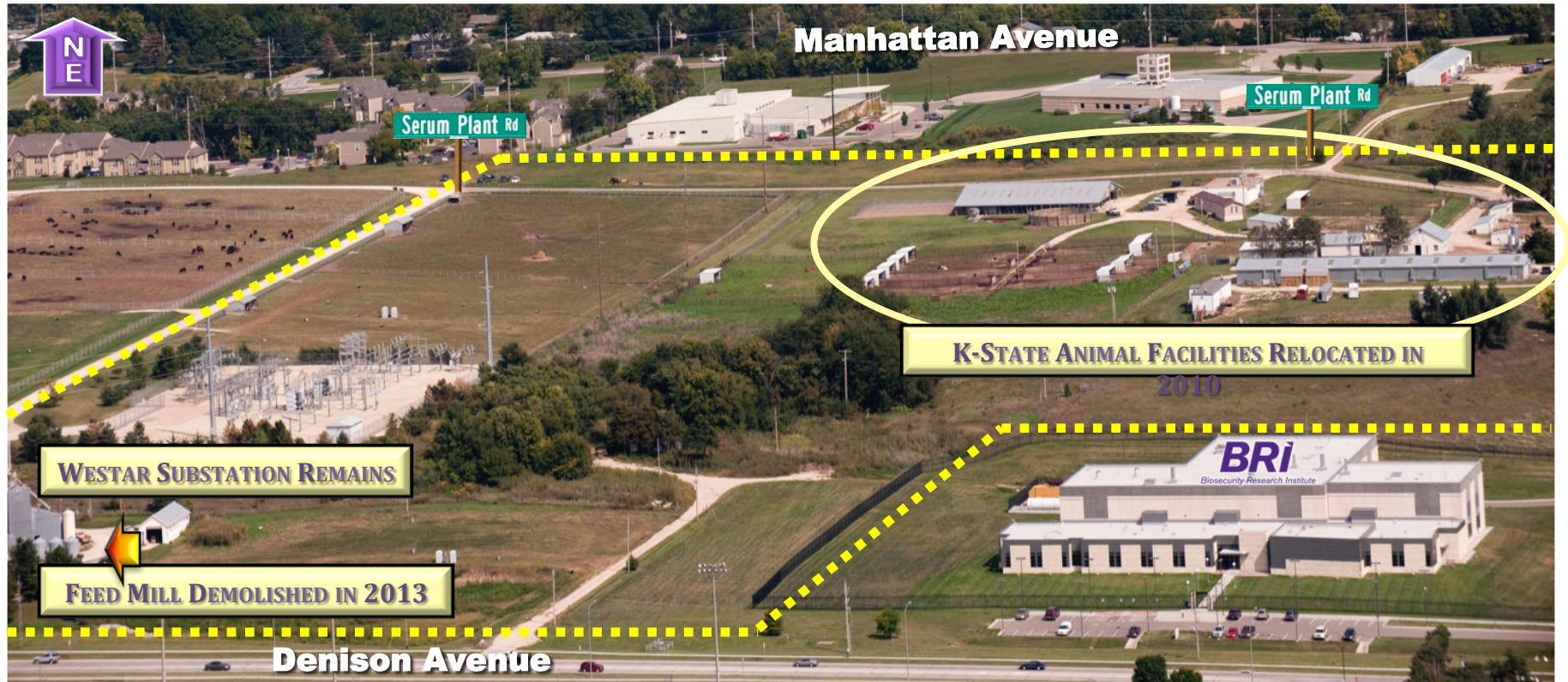
WINSTON  
CHURCHILL





# 2009 CONSTRUCTION SITE FLYOVER

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**



*\*And to Safeguard People from Pandemic Threats Caused by Zoonotic Foreign Animal*

*Diseases*  
**KANSAS STATE**  
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*Serum Plant began producing Hog Cholera  
(Classical Swine Fever) antisera in 1908.  
NBAF R&D on the K-State site >110 Years!*





# CONSTRUCTION TIMELINE

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**

## NBAF Construction Progress to Date + Future DHS Goals\*

### Projected Schedule to Full Operations



<b>KSU Animal Facilities Removed:</b>	<b>10/2010</b>
<b>Construction Manager on Site:</b>	<b>11/2010</b>
<b>\$18M Site Preparation Completed:</b>	<b>08/2012</b>
<b>Land Transfer from Kansas to DHS:</b>	<b>12/2012</b>
<b>\$80M Central Utility Plant Started:</b>	<b>06/2013</b>
<b>KSU Feed Mill on Site Removed:</b>	<b>08/2013</b>
<b>\$834M Lab Construction Started:</b>	<b>05/2015</b>
<b>Central Utility Plant Completed:</b>	<b>10/2015</b>
<b>Complete Lab Construction:</b>	<b>* 03/2021</b>
<b>Select Agent Accreditation:</b>	<b>* 12/2022</b>
<b>Transition from Plum Island:</b>	<b>* 08/2023</b>



*\*And to Safeguard People from Pandemic Threats Caused by Zoonotic Foreign Animal Diseases*



# CUP SUBSTANTIAL COMPLETION

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**



**NBAF EMERGENCY GENERATORS**



**NBAF BOILERS  
SUPERIOR BOILER WORKS  
HUTCHINSON, KANSAS**

**NBAF**   
**Central Utility Plant**  
**October 2015**  
**“Substantial Completion”**

**LABORATORY EXCAVATION ONGOING**  
**Completed in December 2015**

**COOLING TOWERS**  
**MARLEY COOLING TOWER CO.**  
**OLATHE, KANSAS**



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# LAB EXCAVATION BASICALLY COMPLETE

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**



**December 4, 2015**

**All 4 Construction Tower Cranes in Place**



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# MAIN LAB: MOSTLY BELOW GROUND

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**

**November 10, 2016**



*\*And to Safeguard People from Pandemic Threats Caused by Zoonotic Foreign Animal Diseases*



# MAIN LABORATORY: EF-5 DESIGN

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**

**November 08, 2017**

**TOWER CRANES: 4 OF 4 SINCE 12-04-2015**

**TAKEN DOWN  
11/17/2017**

**TAKEN DOWN  
11/18/2017**

**TAKEN DOWN  
04/07/2018**

**TAKEN DOWN  
02/24/2018**



*\*And to Safeguard People from Pandemic Threats Caused by Zoonotic Foreign Animal Diseases*



# MAIN LABORATORY: PROGRESS IN 2018

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**



**November 13, 2018**



*\*And to Safeguard People from Pandemic Threats Caused by Zoonotic Foreign Animal Diseases*



# CONSTRUCTION SITE PANORAMA: 2019

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**

## National Bio and Agro-defense Facility From Bill Snyder Family Stadium June 10, 2019



PHOTOGRAPH BY: PHOTO SERVICES, KANSAS STATE UNIVERSITY



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# MAIN LABORATORY: PROGRESS IN 2020

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**



**September 14, 2020**

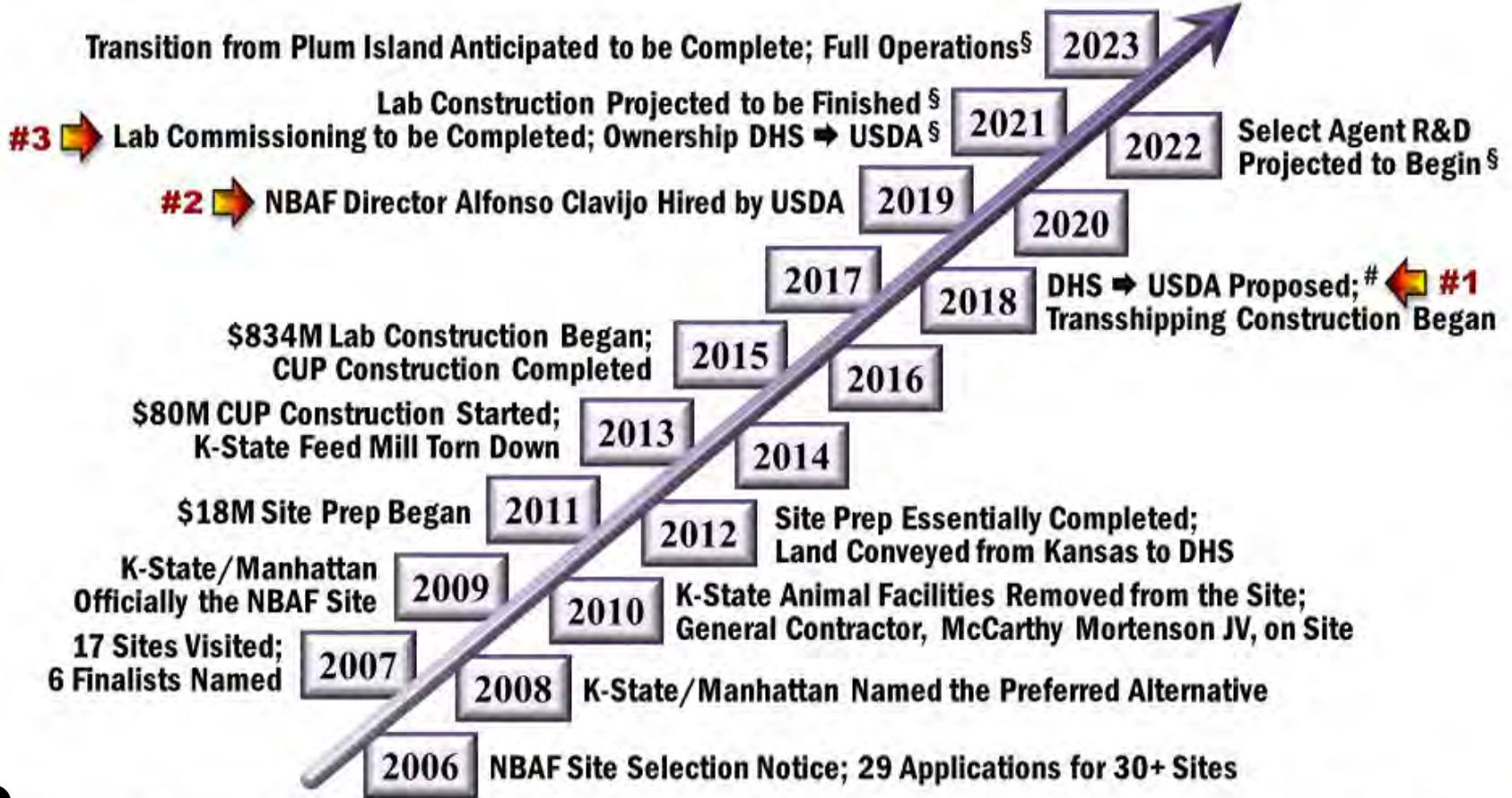


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# TIMELINE RECAP: 2006–2023

*To Protect U.S. Livestock — Cattle/Pigs/Sheep/Goats — from Foreign Animal Diseases\**



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# U.S. BIO / AGRODEFENSE

## Threats and Needs ...

## Yield Opportunities!

*"Opportunities multiply as they are seized."*

SUN TZU







# KANSAS STATE UNIVERSITY: BIO/AGRODEFENSE



Protecting American Agriculture — Crops, Livestock — and Food from Global Biothreats\*



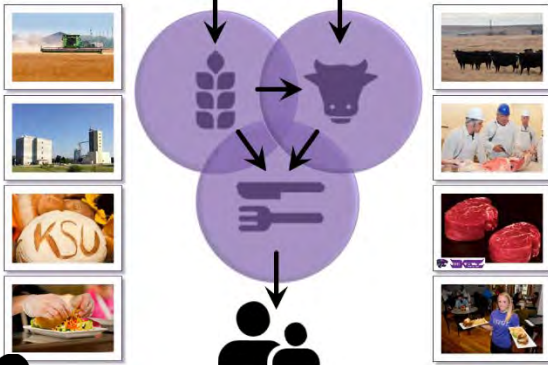
## 1<sup>st</sup> Response Focus on U.S. Agriculture

*Vigilance: Yesterday/Today/  
Tomorrow*

**NBAF**  
in Kansas

*Hits the Mission Bull's-eye!*

 PATHOGENS/TOXINS 



## SEIZING OPPORTUNITIES:

- ✓ Expediting awareness of global biothreats
- ✓ Assessing Kansas and U.S. vulnerabilities
- ✓ Accelerating R&D on ASF/CSF/JE/RVF +++
- ✓ Ensuring bio/agrodefense is a U.S. priority
- ✓ Growing U.S. bio/agrodefense capabilities

**R.W. Trewyn, Ph.D.**

National Bio and Agro-defense Facility Liaison  
Office of the President  
Kansas State University  
006 Anderson Hall

Manhattan, Kansas 66506-0112

Phone: 785-532-6227; Fax: 785-532-7639

E-mail: [trewyn@ksu.edu](mailto:trewyn@ksu.edu); Website: [ksu.edu/nbaf](http://ksu.edu/nbaf)

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WATCH "NBAF FLY-THROUGH" VIDEO: [www.ksu.edu/nbaf](http://www.ksu.edu/nbaf)  
"WE FEED THE WORLD" VIDEO AS WELL.

**THANK YOU!**  
**QUESTIONS?**

**BLUTO**

— “OVER?” —  
*“Was it over when the Germans  
bombed Pearl Harbor?”*

