

# Farm Biosecurity: A Reassessment of Feasible Benefits in an Outbreak

**Richard Horwitz**

**Committee on Foreign and Emerging Diseases  
United States Animal Health Association  
Annual Meeting**

**Providence, RI – October 27, 2015**



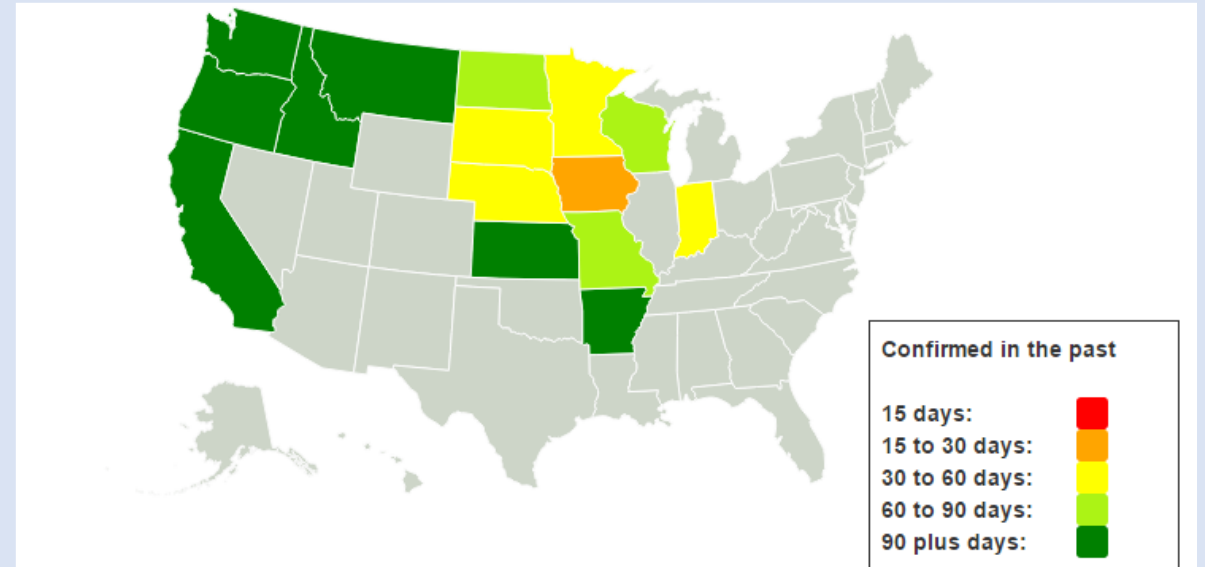
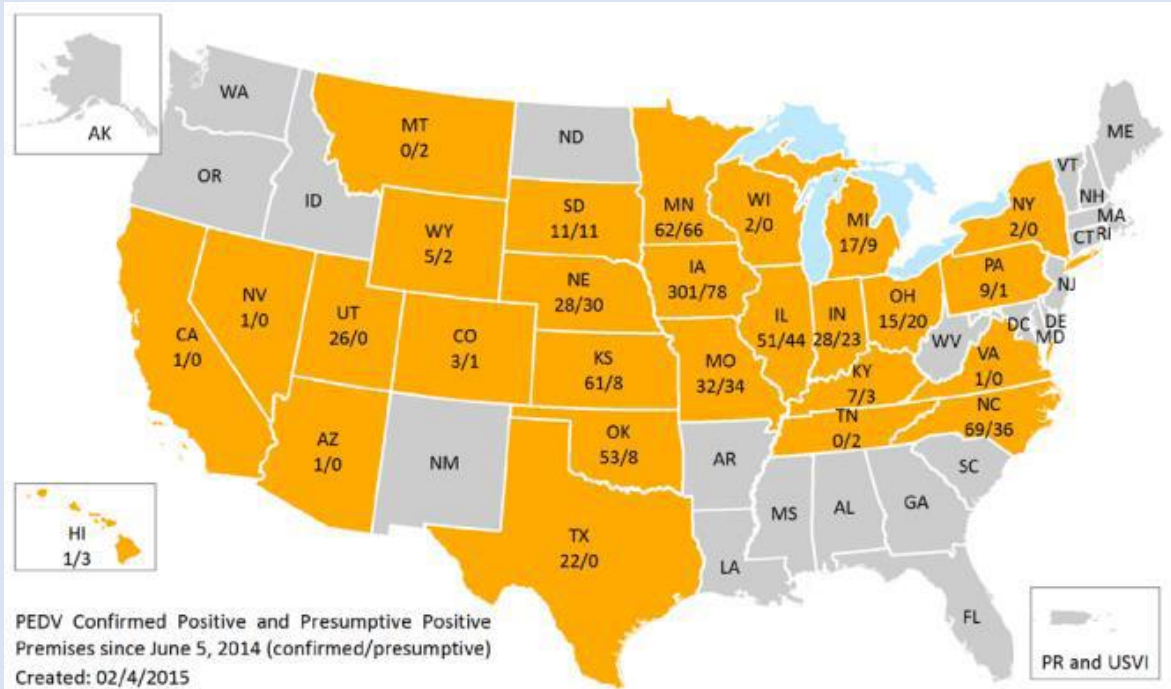
# Message

- **Biosecurity makes sense and works . . . to a point.**
- **More stringent ≠ more effective. It depends.**
- **Have a Plan B, for when containment and germicide fail.**
- **Consider:**

***Biosecurity, Infection-Control,  
and Continuity of Dairy Operations in FMD Response***

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# Prompt – PED, HPAI . . . FMD?



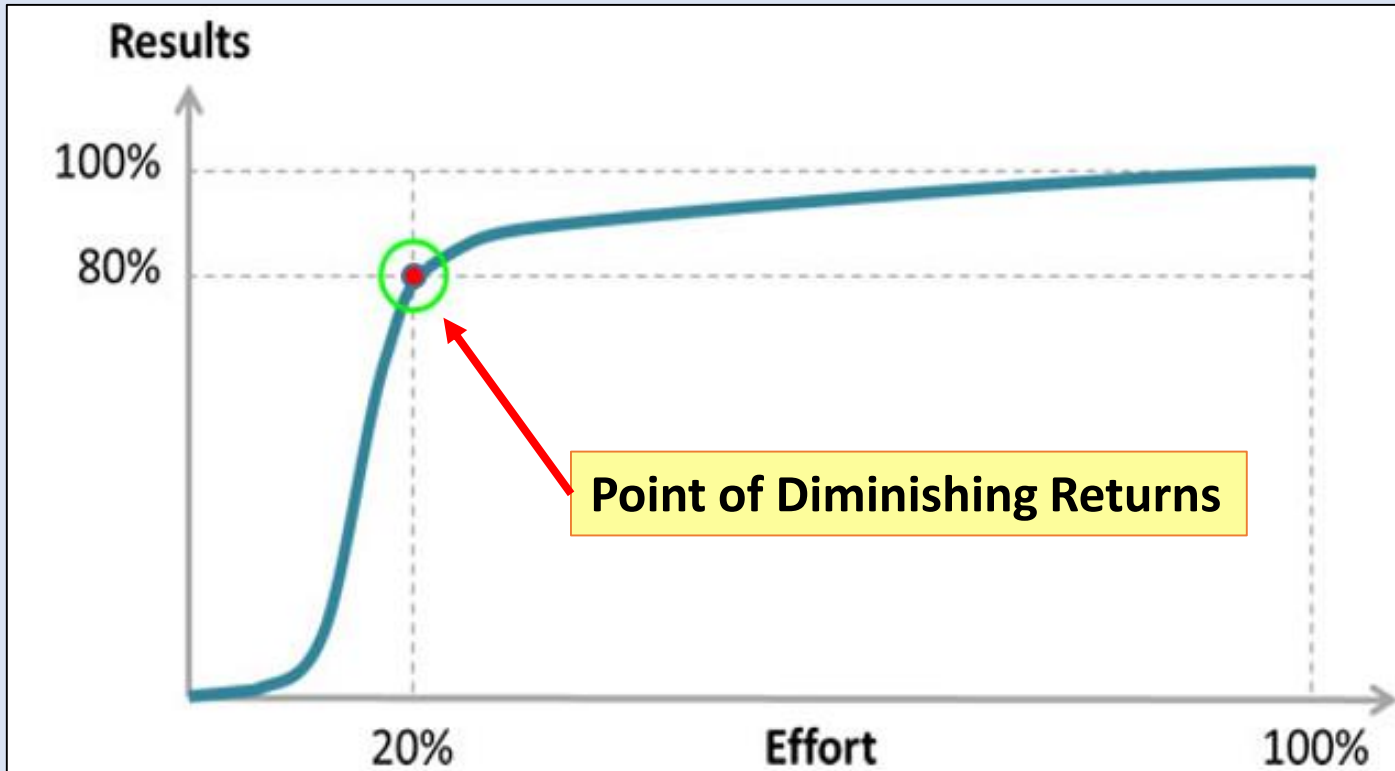
**States and Farms with Confirmed PEDV  
2014-2015**

**223**  
Detections Reported

**48,091,293**  
Birds Affected

**States and Farms with Confirmed HPAI  
2014-2015**

# Prompt – Farm Experience + Pareto



Pareto Curve: Results by Effort

***Pareto Principle:***  
“20% of the input  
[resources, time, effort]  
accounts for 80% of the output  
[results, rewards].”

# Cultural Differences



## Academia/Science

- **Accountability:** professional standards; peers, students, funding agencies
- **Ideal end:** path-breaking contribution
- **Ideal mode:** skeptical, deliberate, uncompromising
- **Better novel than prudent**

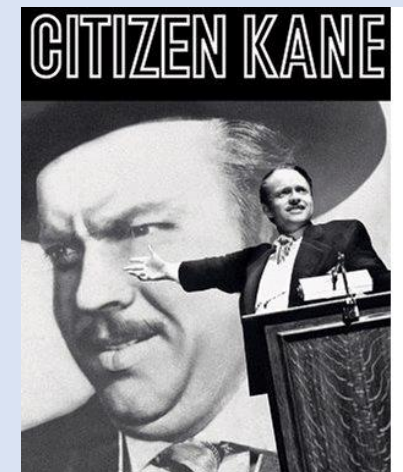
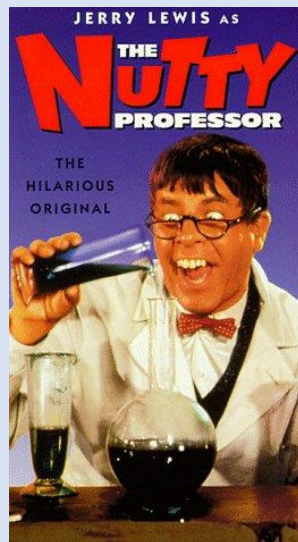
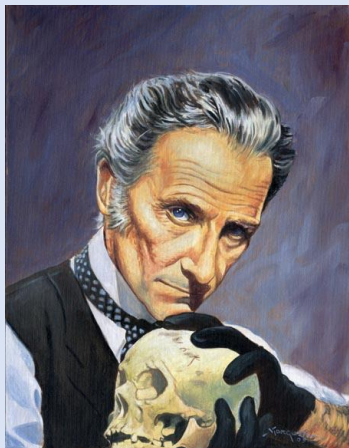
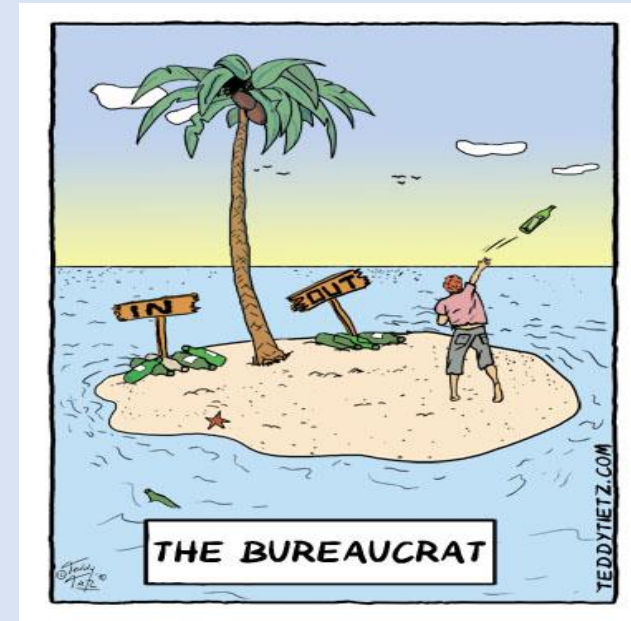
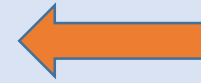


## Government

- **Accountability:** public laws and regulations; supervisors, officeholders, the electorate
- **Ideal end:** popular, effective policy
- **Ideal mode:** pragmatic, calm, compromising
- **Better prudent than novel**



# Stereotype



# Biosecurity – Concept / Ideal



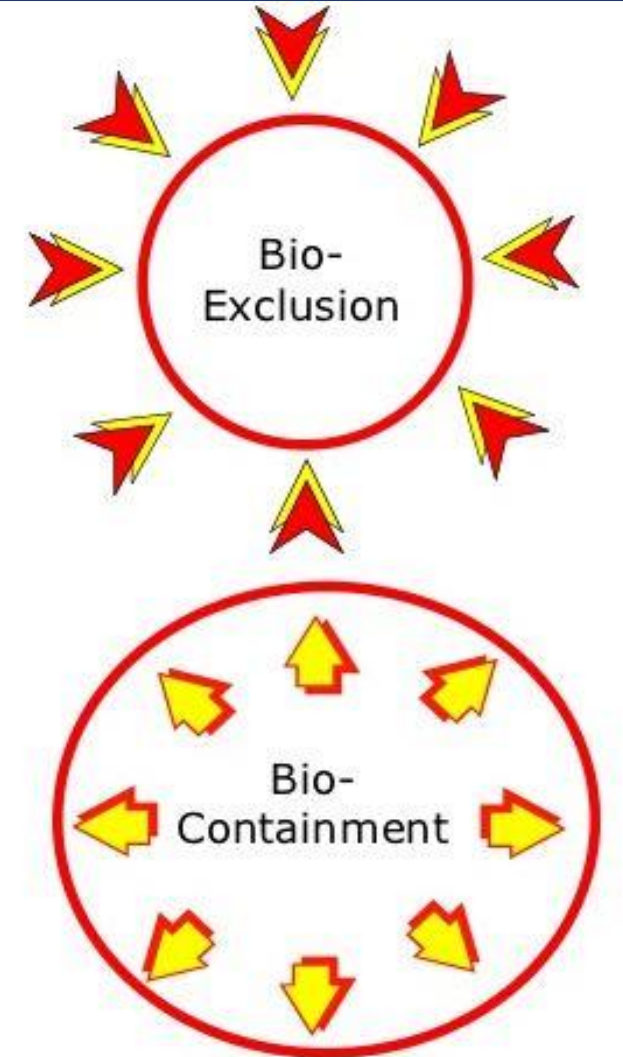
## Bio-Security:

### Bio-exclusion:

- Keeping infectious organisms from entering a facility or population

### Bio-containment

- Keeping infectious organisms from leaving a facility or population



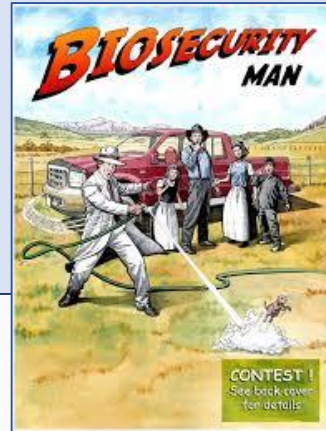
# Biosecurity – Avatar



United States Department of Agriculture  
Animal and Plant Health Inspection Service



WORLD POULTRY



## Poor biosecurity in US 'has helped spread bird flu'



From [www.worldpoultry.net](http://www.worldpoultry.net) - July 5, 5:53 AM

"Poor biosecurity and airborne infection have played a key role in the spread of high pathogenic avian influenza in the US this year, a report from the country's Animal and Plant Health Inspection

Service (Aphis) has suggested."





# Biosecurity – Set of Practices

**A**



**Secure Perimeter**

**B**



**Clean & Disinfect**

**C**

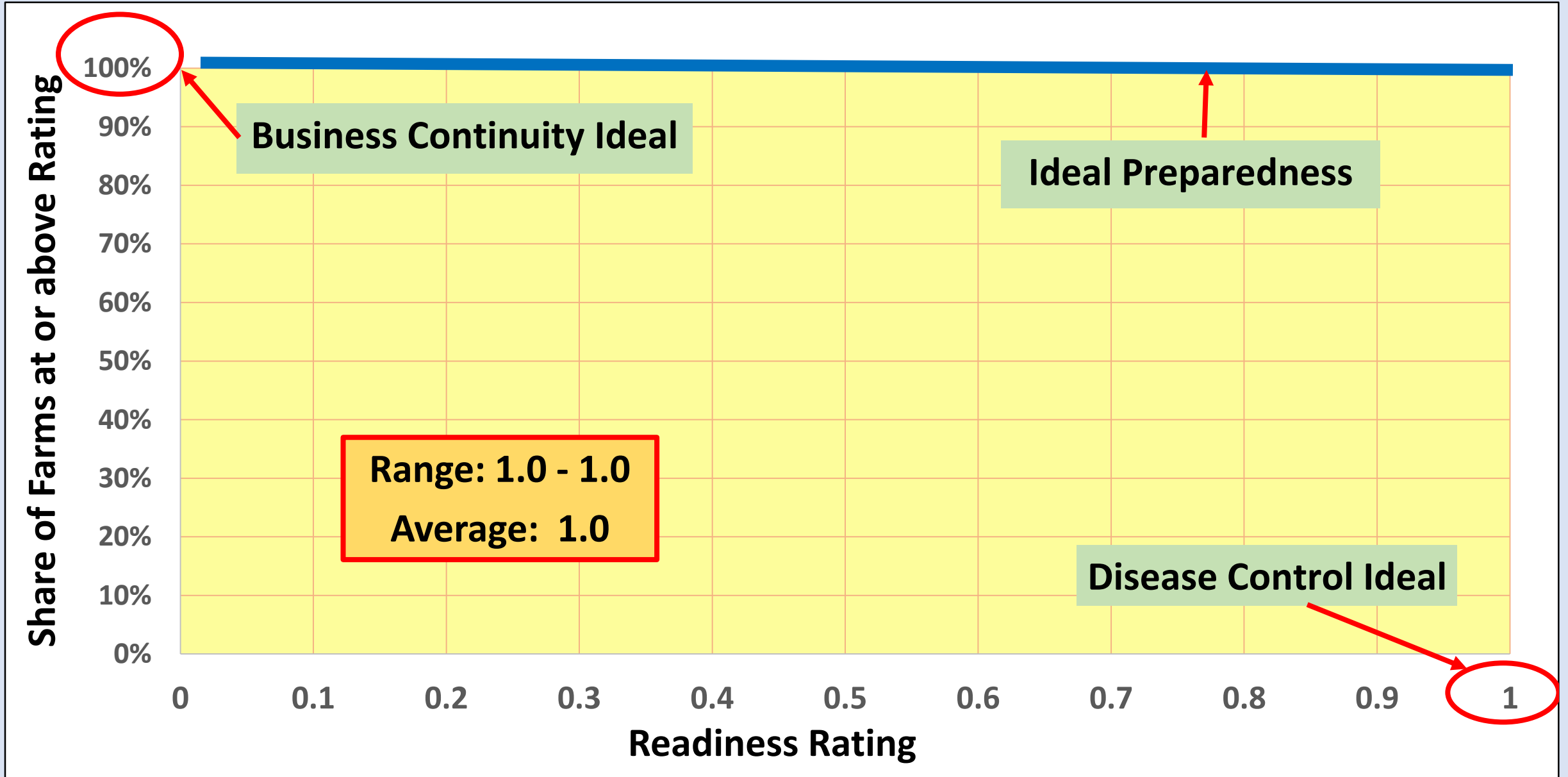


**Monitor Herd Health**

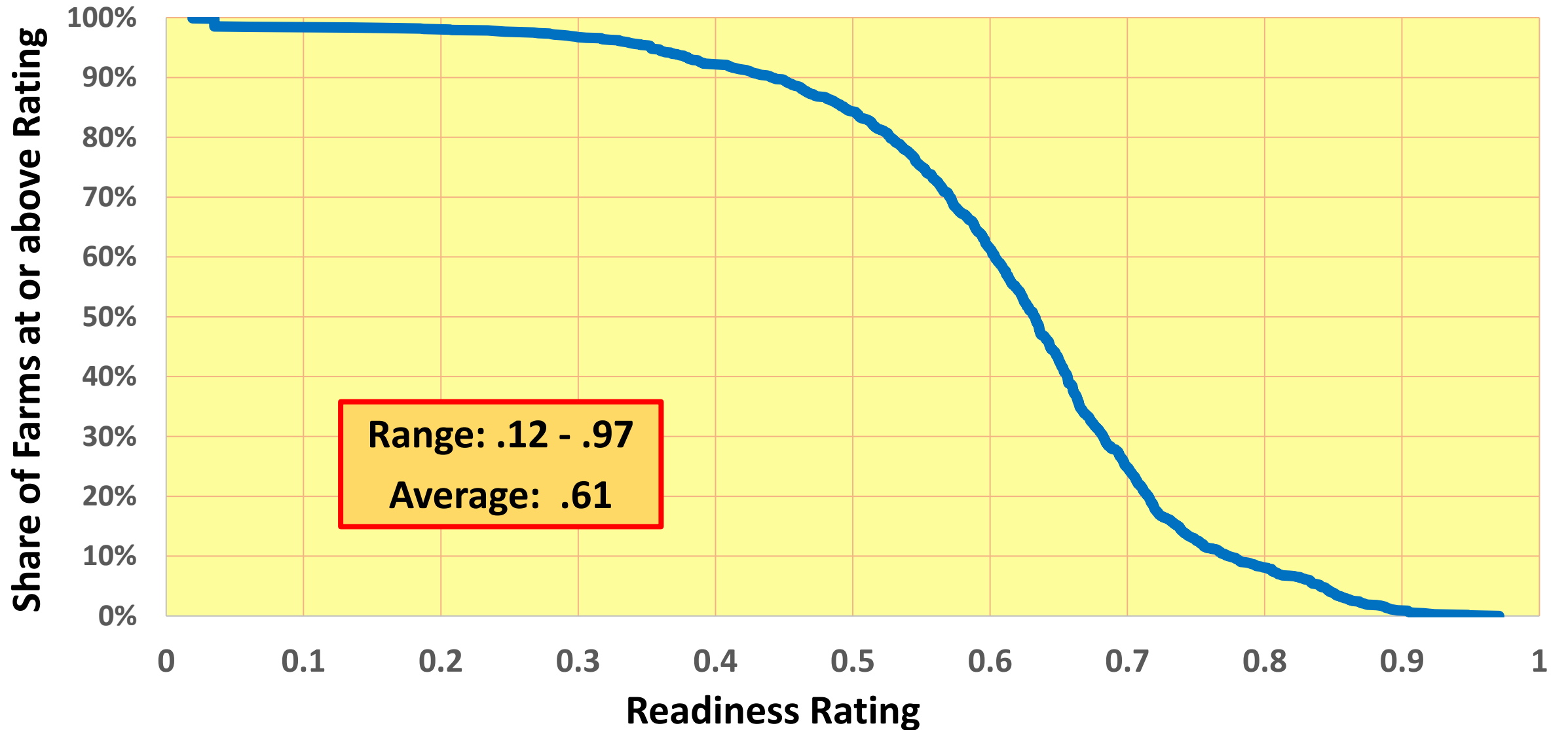
# Biosecurity Objectives and Risks in Benchmarks for Milk Movement Permits

<p><b>OBJECTIVE</b></p> <p>What is the main aim of biosecurity in SMS permitting?</p>	<p><b>BENCHMARK</b></p> <p>How high should the bar be set to allow milk movement?</p>	<p><b>RISK</b></p> <p>What hazard lies on the “safe side” of error?</p>
<p><b>DISEASE CONTROL</b></p>	<p><b>HIGH and FIRM</b></p> <p>Up to a standard that best eliminates risk of infection</p>	<p><b>TOO DISRUPTIVE</b></p> <p>Shut down too many operations</p>
<p><b>BUSINESS CONTINUITY</b></p>	<p><b>FLEXIBLE</b></p> <p>Up to a standard that a critical mass of stakeholders can meet</p>	<p><b>TOO PERMISSIVE</b></p> <p>Shut down too few operations</p>

# Ideal Readiness



# Readiness Measured in Region - 2015



# Defense of Flexible, Feasible Tactics

- **Limits in resources for prevention and response**
- **Limits in “science” on specific, real-world practices**
- **Diminishing returns of decon and containment**
- **Benefits of preparing for trade-offs**
- **Toward a better Plan A . . . and Plan B**

# THE DAILY NEWS

www.dailynews.com

Your source of truthiness

- Since 2014

## Researcher: 'The Science Sucks!'



Blah, blah, blah blah  
blah blah, says a  
recent study, but  
some experts  
disagree.

He said, "Blah blah  
blah blah. Blah blah  
blah blah!"

She said, "Definitely  
not blah blah blah.  
Not blah, blah blah  
blah blah!"

He said, "More Blah  
blah blah blah. Blah  
blah blah blah!"

She said,  
"Absolutely not! Not  
blah, blah blah blah  
blah!"

More research  
should tell. Maybe.

Maybe we're all  
screwed.

# Limits in Science of Biosecurity Risk Assessment and Remediation

- **Not much data from the workaday world.**
- **Coverage is uneven.**
- **Much of the analysis is anecdotal or speculative.**
- **Tactical implications tend to be biased.**

# Lessons from Human Healthcare Facilities and HAI Experience

- **More field-tested data and more science.**
- **Recommendations graded by quality and relevance of science.**
- **Tactics chosen for proven health benefits (vs. sentinel data).**
- **Tactics adapted to diminishing returns.**





Related



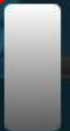
**BOGGUS**

DEVELOPING STORY

**“Biosecurity Won’t Work”**



00:27



SITUATION ROOM

-01:56



# Limits of Containment and Germicide

- **Tactics best target direct (vs. indirect) transmission.**
  - **Benefits of environmental decon are elusive and short-lived.**
  - **Expect no more than about 50% compliance from trained staff.**
  - **Long dwell times for disinfectant may be impractical and ineffective.**
  - **Detergent may be better than disinfectant, anyway.**
- **Adapt tactics to evolutionary and ecological dimensions of pathogen-host relations.**

# Plan A: Improve Readiness



- **Better engage producers, employees, and suppliers**
- **More tactical and site-specific preparations and plans**
- **More consistent standard precautions in ordinary operations**
- **Increase traceability in the food supply chain**
- **Better surveillance of the most virulent diseases**

# Knowing that Plan A may fail . . .

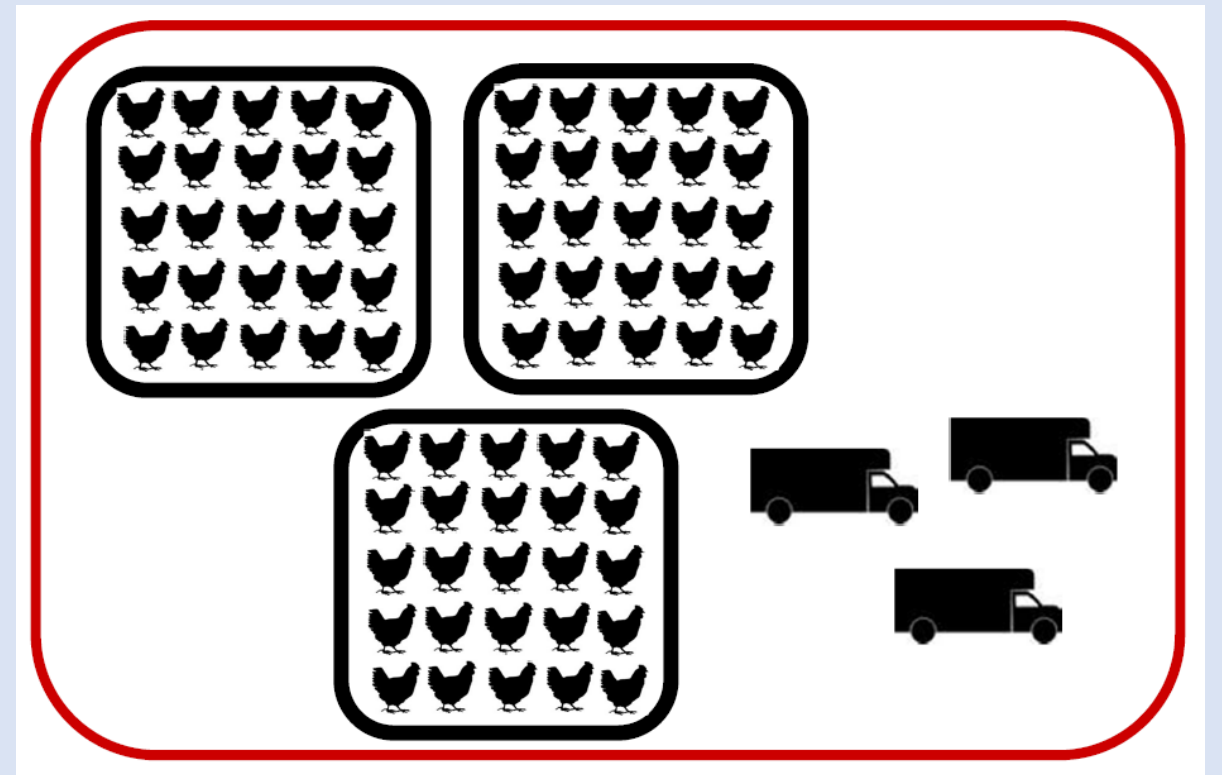
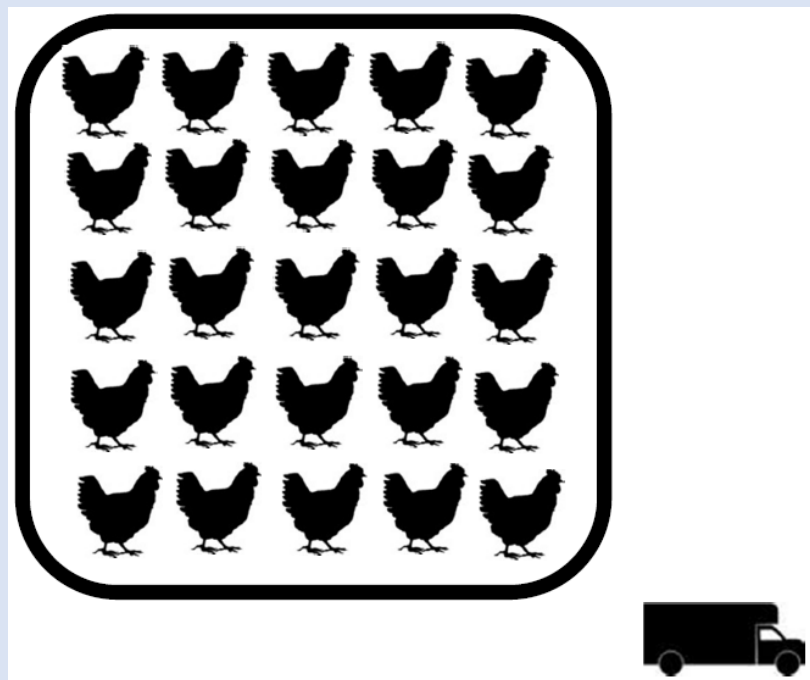
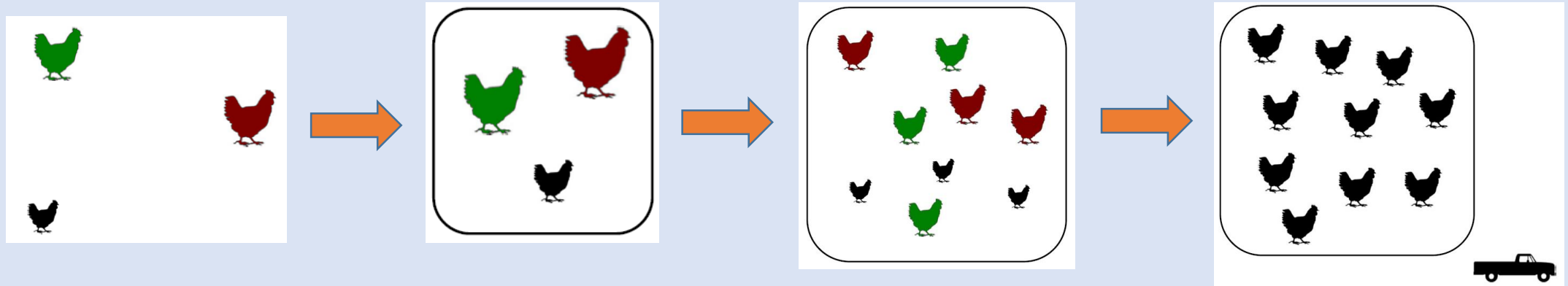


- **Increase ability to suspend and restart animal movement**
- **Increase ability to contain losses within each facility**
- **Increase ability to depopulate and dispose of carcasses**
- **Increase genetic diversity of stock and microbial environment**

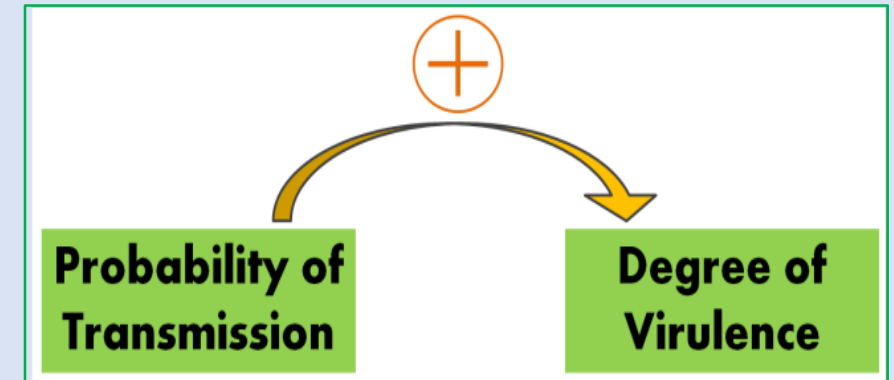
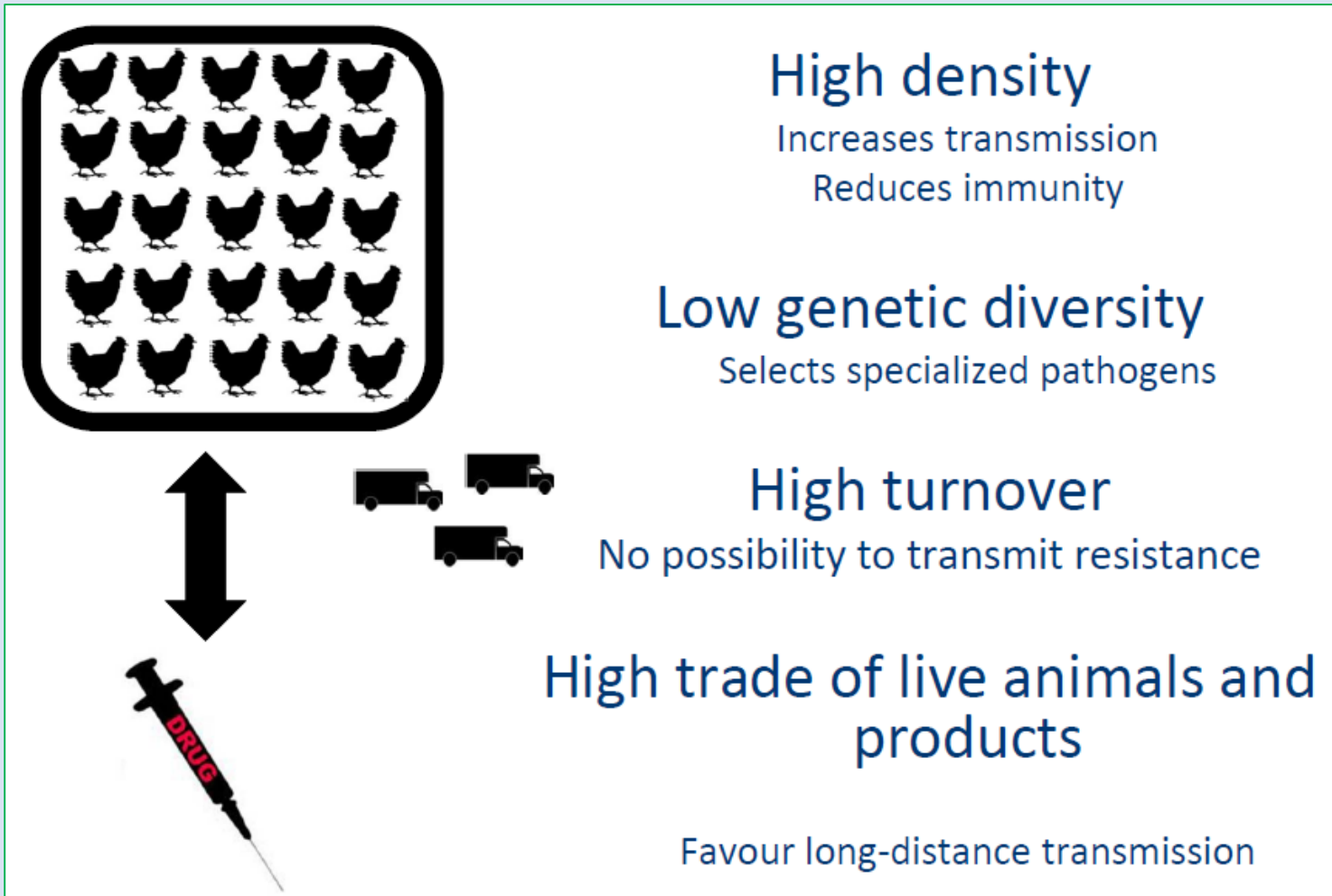
# Biosecurity for the Future: Beyond Containment and Germicide

- **Decrease density of livestock**
- **Decrease dependence on long-distance service**
- **Increase genetic diversity of herds**
- **Aim to live with a dynamic microbial environment**

# Intensification: Elevating Biosecurity AND Risk



# Biosecurity: Beyond Containment and Germicide



# Message

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- Consider:

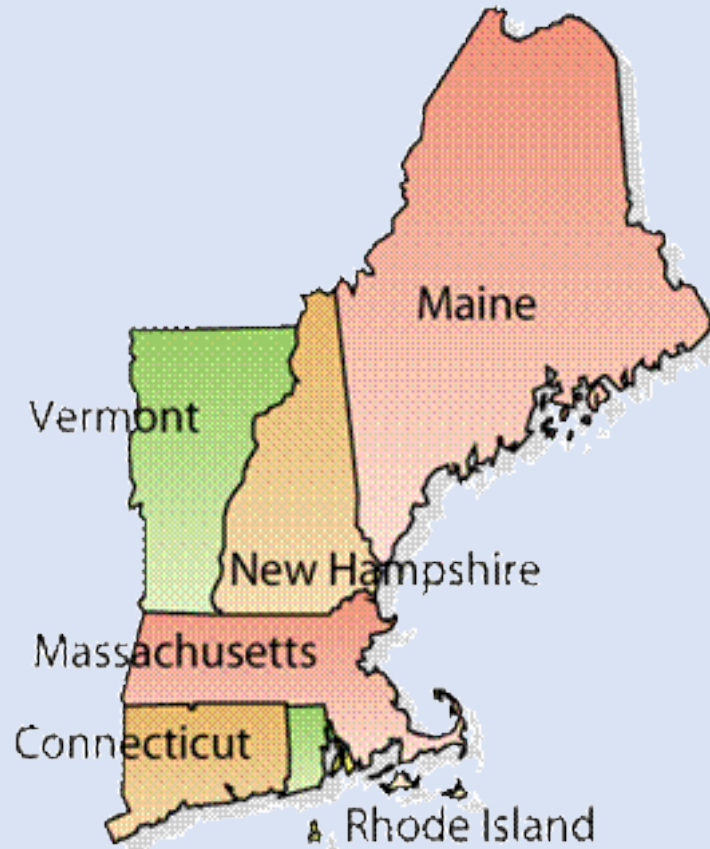
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# Thanks!



# Contact Information



On-line at

[NESAASA.weebly.com](http://NESAASA.weebly.com)



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