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Why Do Producers Partially Implement Biosecurity Recommendations of Experts?

Economics of Animal Health Session

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Does Partial Biosecurity Reflect Producer Knowledge Gaps?

- Perhaps,
  - ➢Ongoing education can help

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  - but we must consider economic incentives

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✓ **Bottom-line**: lack of knowledge is likely NOT sole reason for partial implementation of recommended biosecurity measures

Are Available Biosecurity Measures Effective & Feasible to Implement?

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- Why create something with low odds of adoption?
  - How would investors on *Shark Tank* react?

Effectiveness & Feasibility

- Why create something with limited odds of adoption?
  - How would investors on *Shark Tank* react?

- Just because a biosecurity measure "works" doesn't mean it will be 100% implemented
  - Feasibility, effectiveness, & net econ. value are key
    - E.coli vaccines for fed cattle are prime example

Expert Opinion on Animal Disease Biosecurity in the U.S.

- Short online survey, April 2016
  - Nat'l Institute of Animal Ag. (NIAA, Katie Ambrose)
  - American Assoc. of Swine Vets. (AASV, Harry Snelson)
- N=130
  - Beef cattle, dairy cattle, and swine versions
- 7% Lower-bound, estimated response rate

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Expert Survey – Tier 1 Focus

Diseases characterized as *Tier 1* are those of national concern and pose the most significant threat to U.S. agriculture as they have the highest risks and consequences.

Currently known *Tier 1* diseases include African swine fever, classical swine fever, foot and mouth disease, avian influenza, and virulent Newcastle disease.

Expert Survey – Risk Reduction Impact

"What share of national adoption (0-100%) do you expect the U.S. swine industry would achieve in the first year of a large Tier 1 disease outbreak if a given biosecurity measure reduced a firm's own risk of a Tier 1 disease outbreak by X% and reduced their closest neighbor's risk by Y%?"

Available answers: 0%, 1%-10%, 11%-20%, …, 91%-100%

Expert Survey – Risk Reduction Impact

Impact of Own- & Neighbor-Risk Reduction on National Adoption				
	POOLED	BEEF	DAIRY	SWINE
Intercept	42.219	18.654	32.608	49.676
Own-Risk Reduction	0.225	0.288	0.237	*0.110*
Neighbor-Risk Reduction	0.238	0.273	0.230	0.197
Beef	-18.717			
Dairy	-9.391			
Sigma	21.038	21.938	22.572	17.416
Mean Adoption (%)	55.654	47.167	55.965	65.756
N	130	48	43	39
H0: Own-Risk=Neighbor-Risk	Fail to Reject	Fail to Reject	Fail to Reject	Fail to Reject
p-value	0.138	0.913	0.965	0.547
H0: Dairy=0, Beef=0	Reject			
p-value	0.000			

Estimates in *italics* are NOT significant at the 5% level.

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Expert Survey – Cost Impacts

"What share of national adoption do you expect the U.S. swine industry would achieve in the first year of a large Tier 1 disease outbreak if a given Tier 1 disease targeted biosecurity measure costs $X/operation in one-time, up-front implementation costs and $Y/animal/operation/year in annual maintenance costs on the operation?"

Available answers: 0%, 1%-10%, 11%-20%, …, 91%-100%

Expert Survey – Cost Impacts

Impact of Fixed & Variable Costs on National Adoption				
	POOLED	BEEF	DAIRY	SWINE
Intercept	74.365	46.044	71.054	76.159
Fixed Costs	-0.002	-0.002	-0.004	*0.000*
Variable Costs	*-2.189*	*0.388*	*-1.979*	-6.006
Beef	-22.400			
Dairy	-9.952			
Sigma	23.963	21.730	25.898	22.387
Mean Adoption	46.275	36.333	48.756	56.026
N	129	48	43	38
H0: Fixed=Variable	Fail to Reject	Fail to Reject	Fail to Reject	Reject
p-value	0.137	0.860	0.466	0.020
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Expert Survey: Benefit-Costs Views

If biosecurity measures aimed at reducing *Tier 1* disease risks were put in place industrywide, How do you think the resulting *benefits* would be distributed through the pork industry's supply chain?

Please allocate the percentage (summing to 100%) each of the following sectors capture

Expert Survey: Benefit-Costs Views

	Industry Sectors	Benefits	Costs	Difference
Dairy	Retailers	21.0	9.1	11.9
	Processors	26.9	18.4	8.5
	Dairy Producers	52.1	72.6	-20.4
Beef	Retailers	16.6	5.6	11.0
	Processors	20.9	9.7	11.2
	Feedlot	28.0	30.8	-2.8
	Stocker/Backgrounder	16.3	22.3	-5.9
	CowCalf	18.1	31.6	-13.5
Swine	Retailers	12.2	2.6	9.5
	Processors	17.4	8.1	9.2
	Finishing	21.6	25.1	-3.5
	Nursery	14.9	23.6	-8.6
	Sow-Breeding	33.9	40.6	-6.6

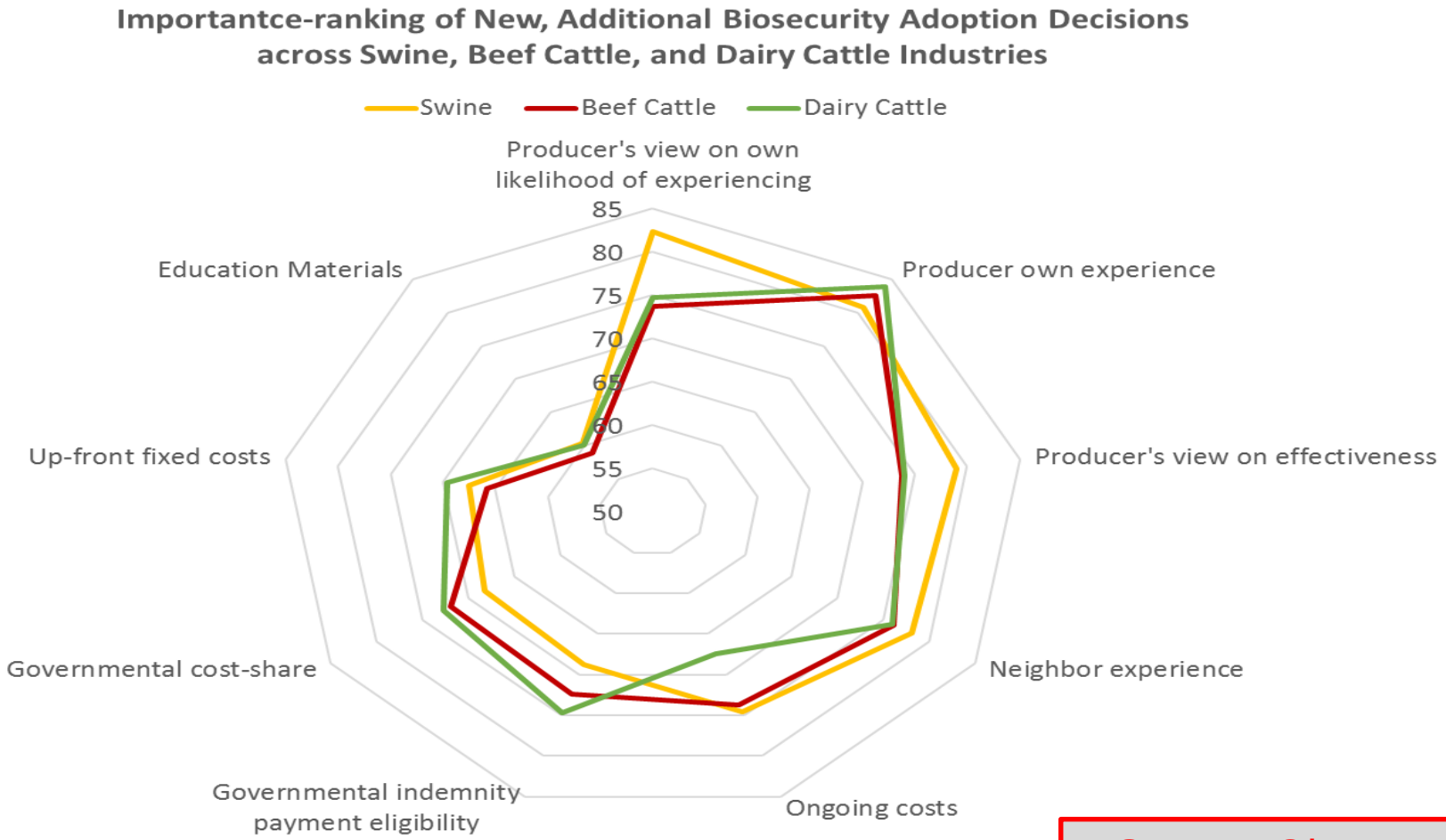
N=86 (35 beef, 34 dairy, 17 swine) as of 4/1/16

Expert Survey: Adoption Decision Drivers

How important are the following factors in a typical swine producer's decision to adopt and implement new, additional biosecurity measures aimed at reducing *Tier 1* disease risks in the swine industry during the first year of a large outbreak?

Importance Scale Answers
(0=not important; 100 = utmost importance)

Expert Survey: Adoption Decision Drivers



Source: Qianrong Wu & Lee Schulz, Iowa State Univ.

Expert Survey – Synthesis

- Adoption expected to be highest in Swine & lowest in Beef
- Own- & Neighbor- risk reductions matter ~equally
- Fixed costs may be more important than Variable costs

Expert Survey – Synthesis

- Costs>Benefits for Producers underlies partial adoption…

- Views & Experience > Costs & Education in adoption decision

More information available at:

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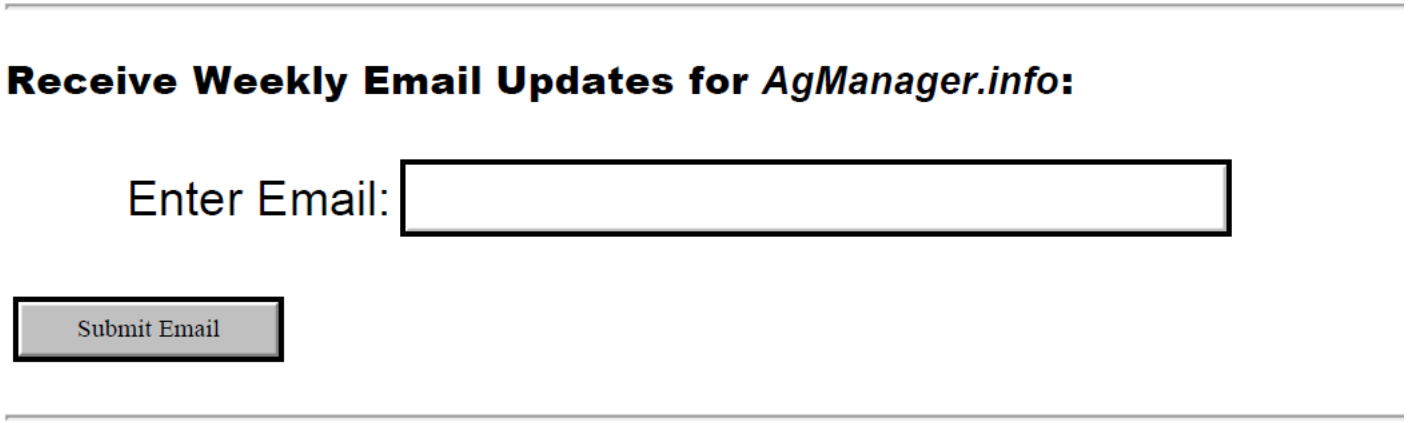

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