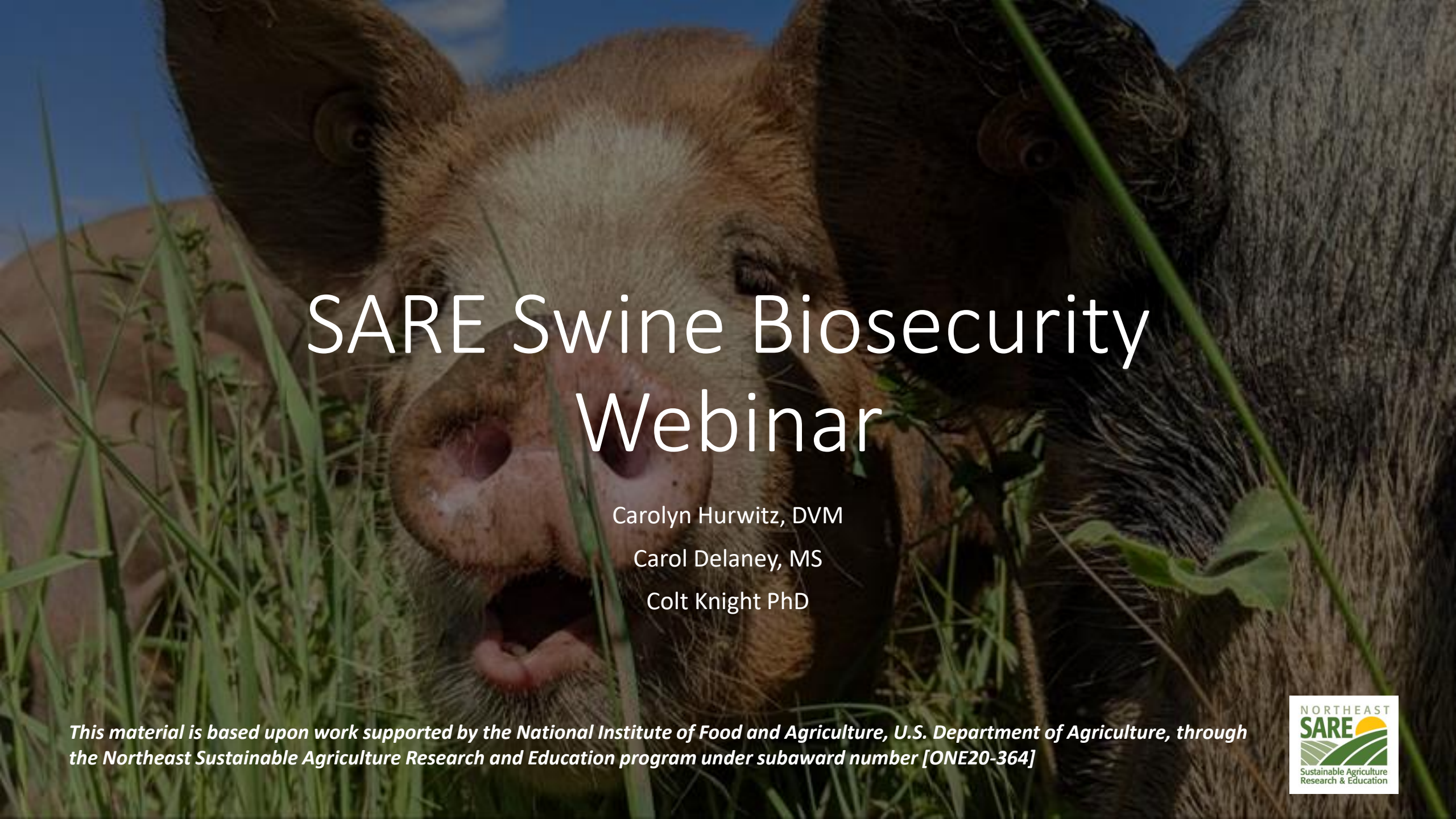

SARE Swine Biosecurity Webinar

Carolyn Hurwitz, DVM

Carol Delaney, MS

Colt Knight PhD

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NORTHEAST SARE Sustainable Agriculture Research & Education

Schedule

- Introductions
- Partner Farmer Profile Highlights
- Partner Farmer Biosecurity Highlights
- Biosecurity On Swine Farms
- 5 Minute Break
- Biosecurity to Control Infectious Diseases of Swine
- Adjourn- Question and Answer

Introductions

- Carolyn Hurwitz, DVM
  - SARE Project Lead
  - Assistant State Veterinarian, ME DACF AH
- Carol Delaney, MS
  - SARE Project Co- Leader
  - Livestock Specialist, ME DACF AH
- Colt Knight, PhD
  - SARE Project Research Team
  - State Livestock Specialist; University of Maine Cooperative Extension

New Hampshire Department of Agriculture, Markets and Food

- State Veterinarian
  - Dr. Steve Crawford
- Assistant State Veterinarian
  - Dr. Nate Harvey
- Veterinary Technician- Animal Industry
  - Alicia Pedemonti

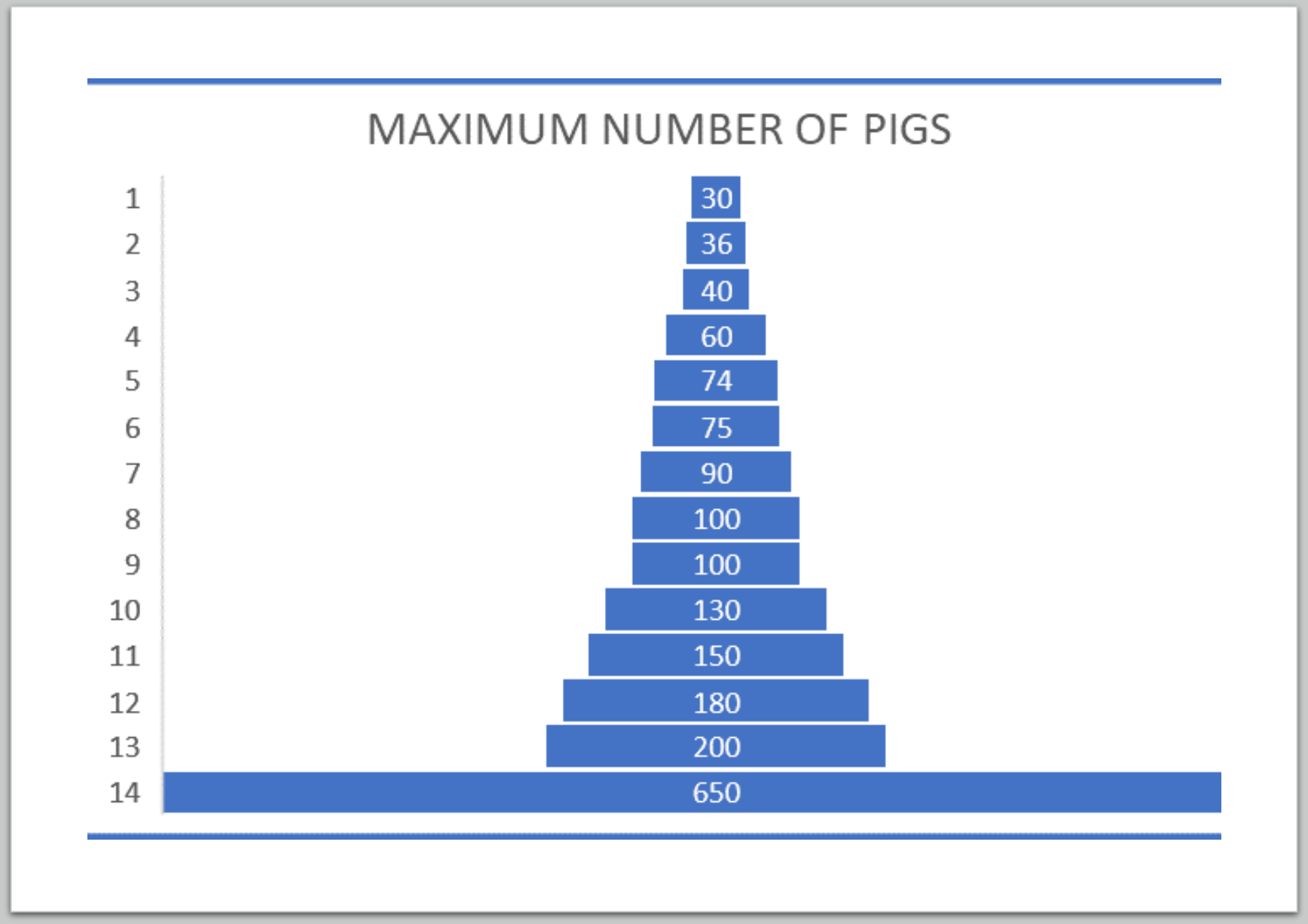
University of New Hampshire Cooperative Extension

- Dairy, Livestock & Forage Crops Field Specialist
  - Elaina Enzien

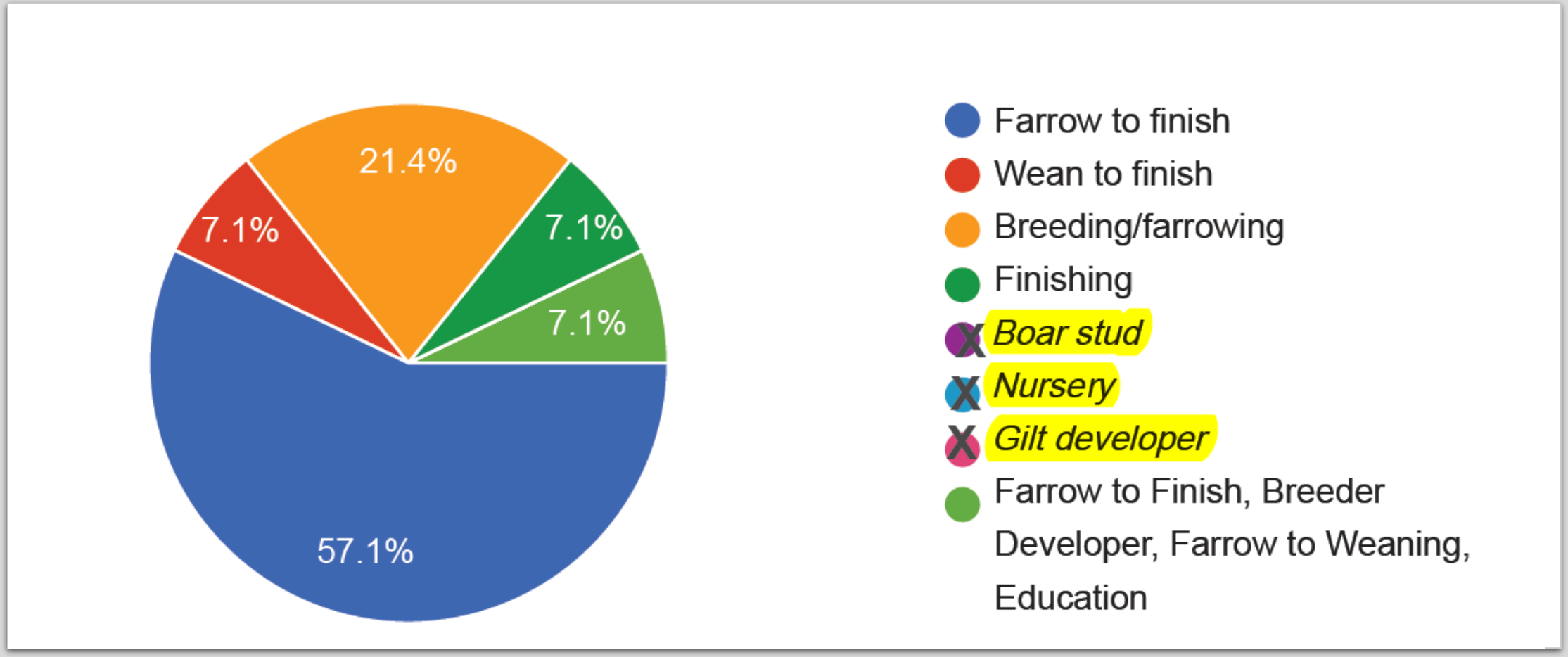
SARE Partner Farmer Profile Reports

- **Farm size**
- **Farm type**
- **Farmer Demographics**
- **Farmer Resources**

SARE Partner Farmer Profiles



SARE Partner Farmer Profiles



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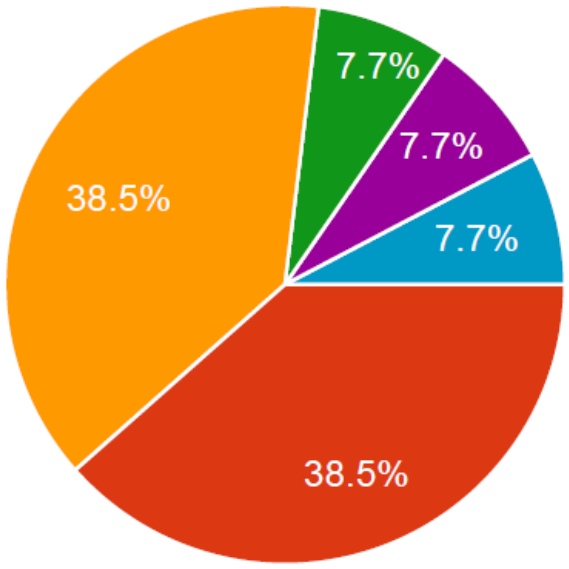


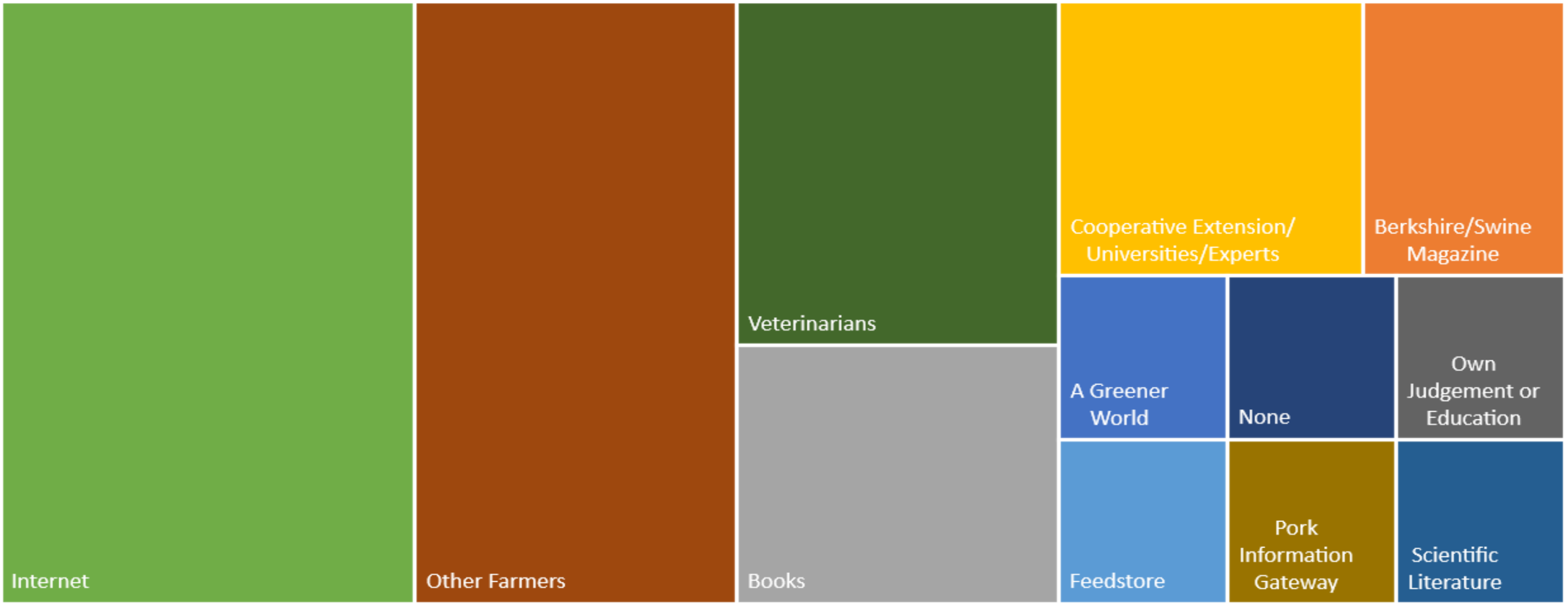
AGE RANGE

- 18 - 29
- 30 - 39
- 40 - 49
- 50 - 59
- 60 - 69
- 70 plus

Year Range	Responses	Percent
0 to 5 years	3	21%
6 to 10 years	4	30%
11 to 15 year	3	21%
16 to 20 year	3	21%
over 20 years	1	7%
Grand Total	14	100%

NUMBER OF YEARS FARMING

Top Sources of Information

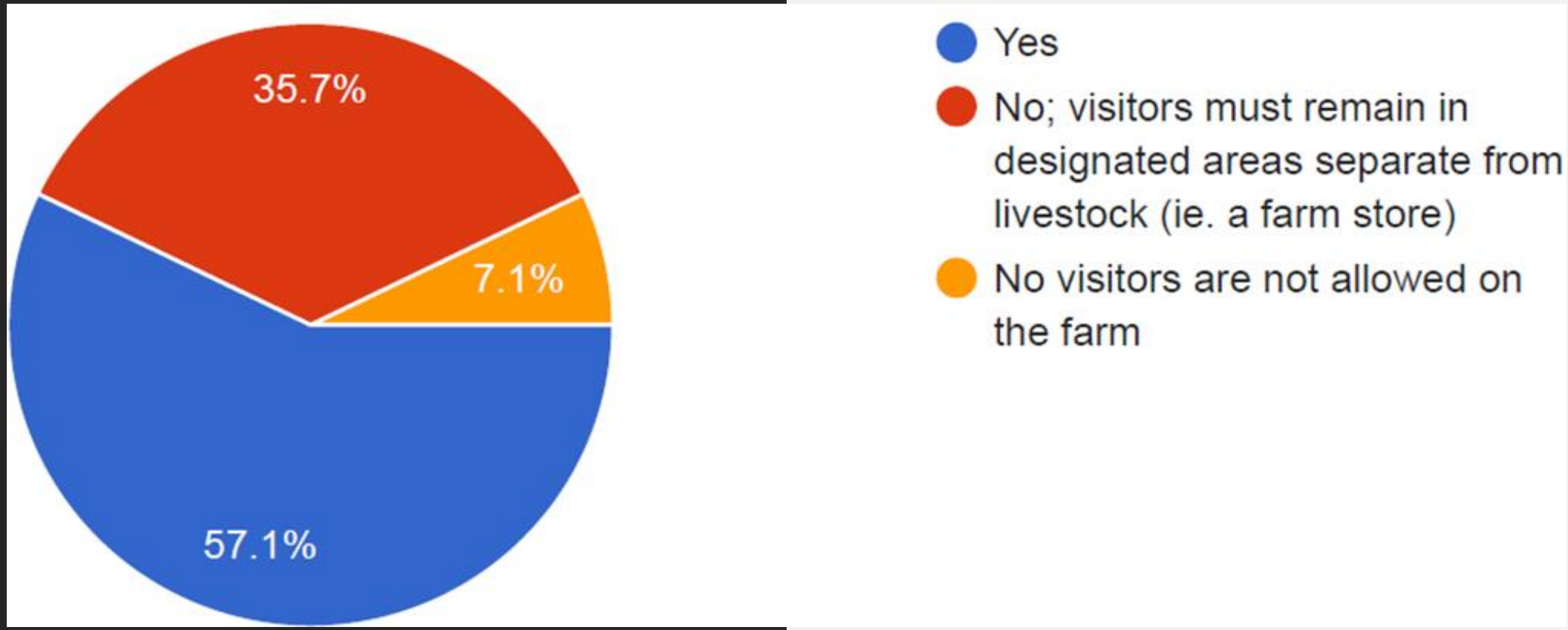


SARE Partner Farmer Biosecurity Reports

- **Farm Visitation Policies**
- **Exposure to other livestock**
- **Confidence level of farm protection**

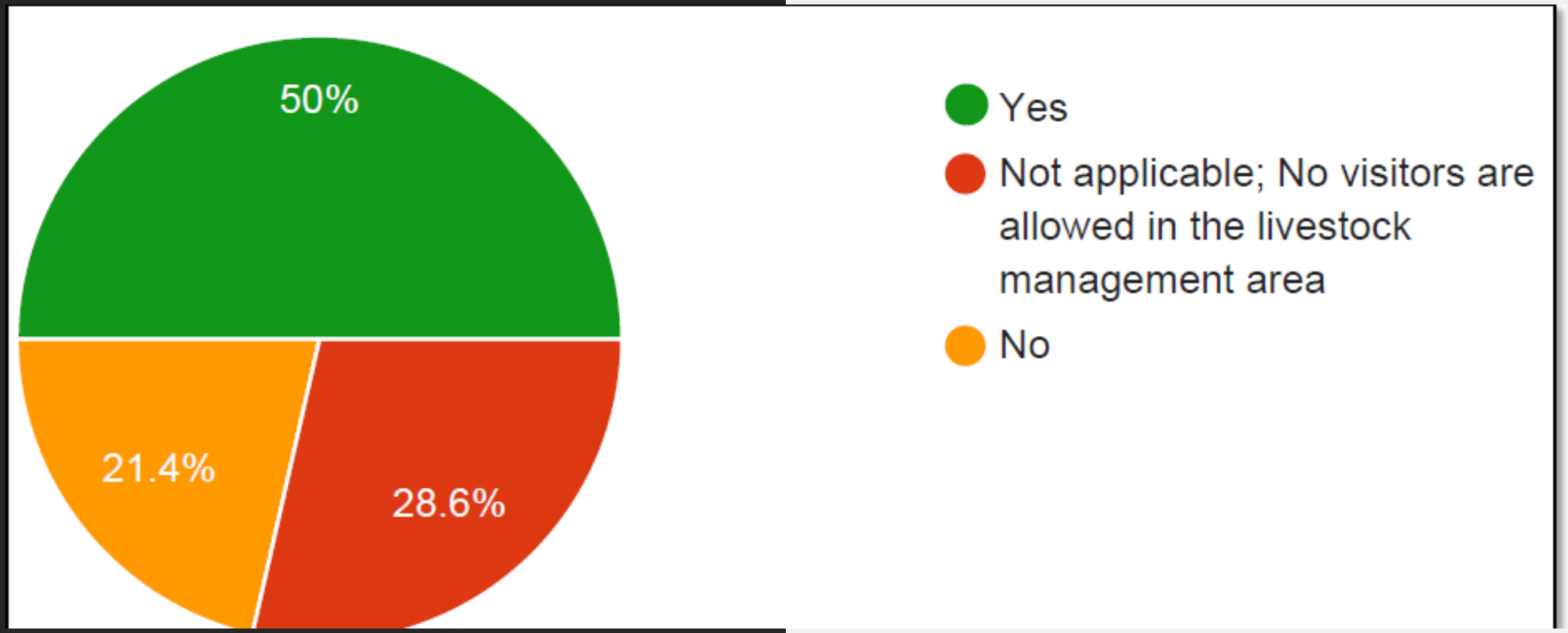
SARE Partner Farmer Biosecurity Reports

Visitor Access to Livestock Areas?

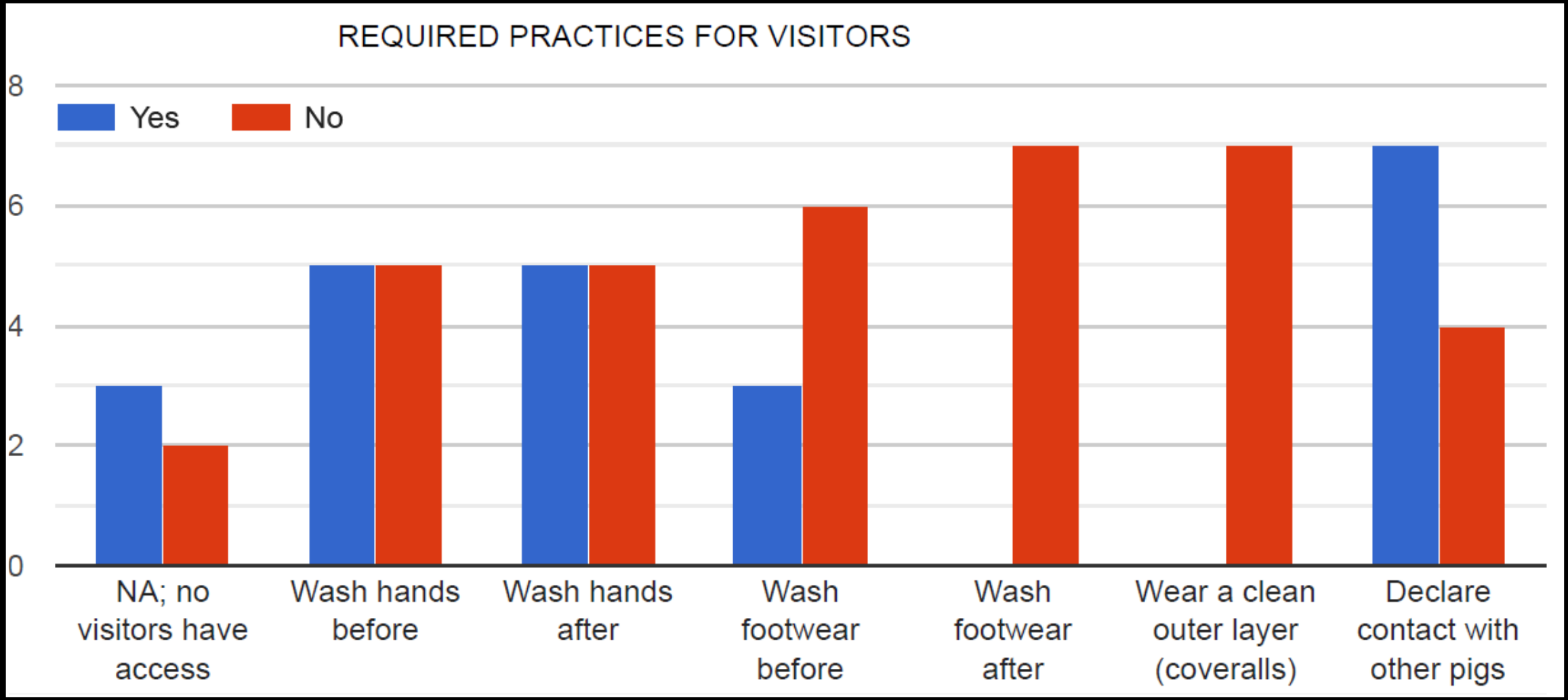


SARE Partner Farmer Biosecurity Reports

Direct Visitor Contact with Pigs?

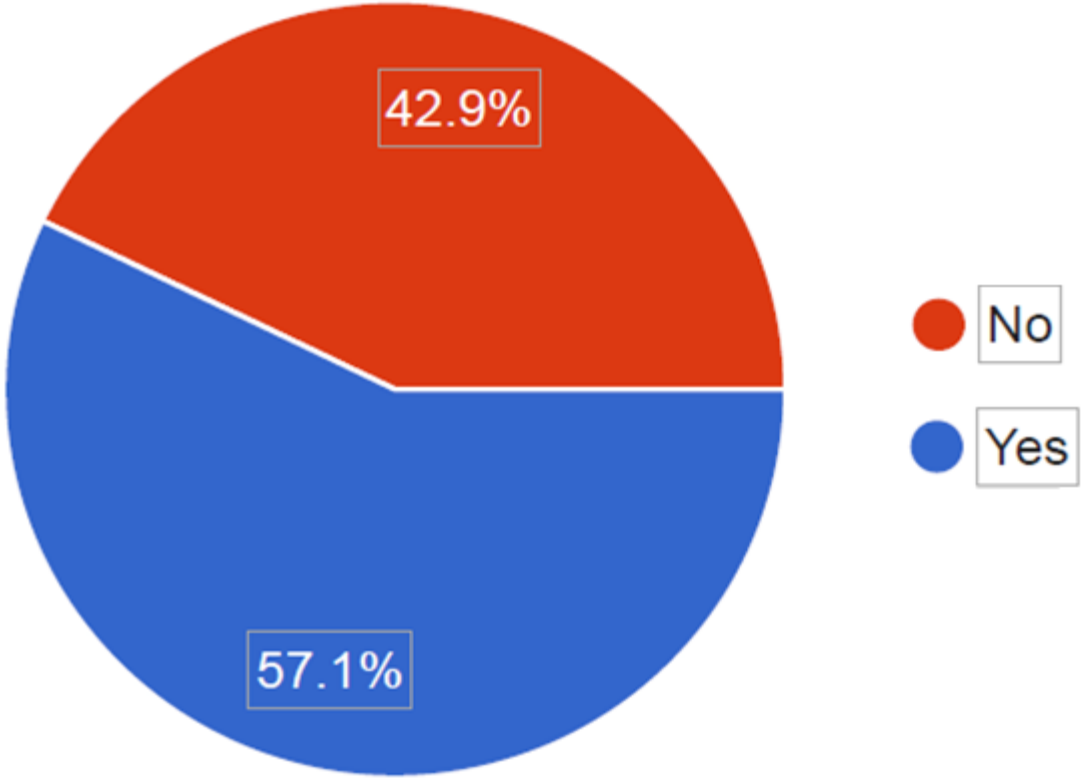


SARE Partner Farmer Biosecurity Reports



SARE Partner Farmer Biosecurity Reports

Pigs in contact with other livestock on farm

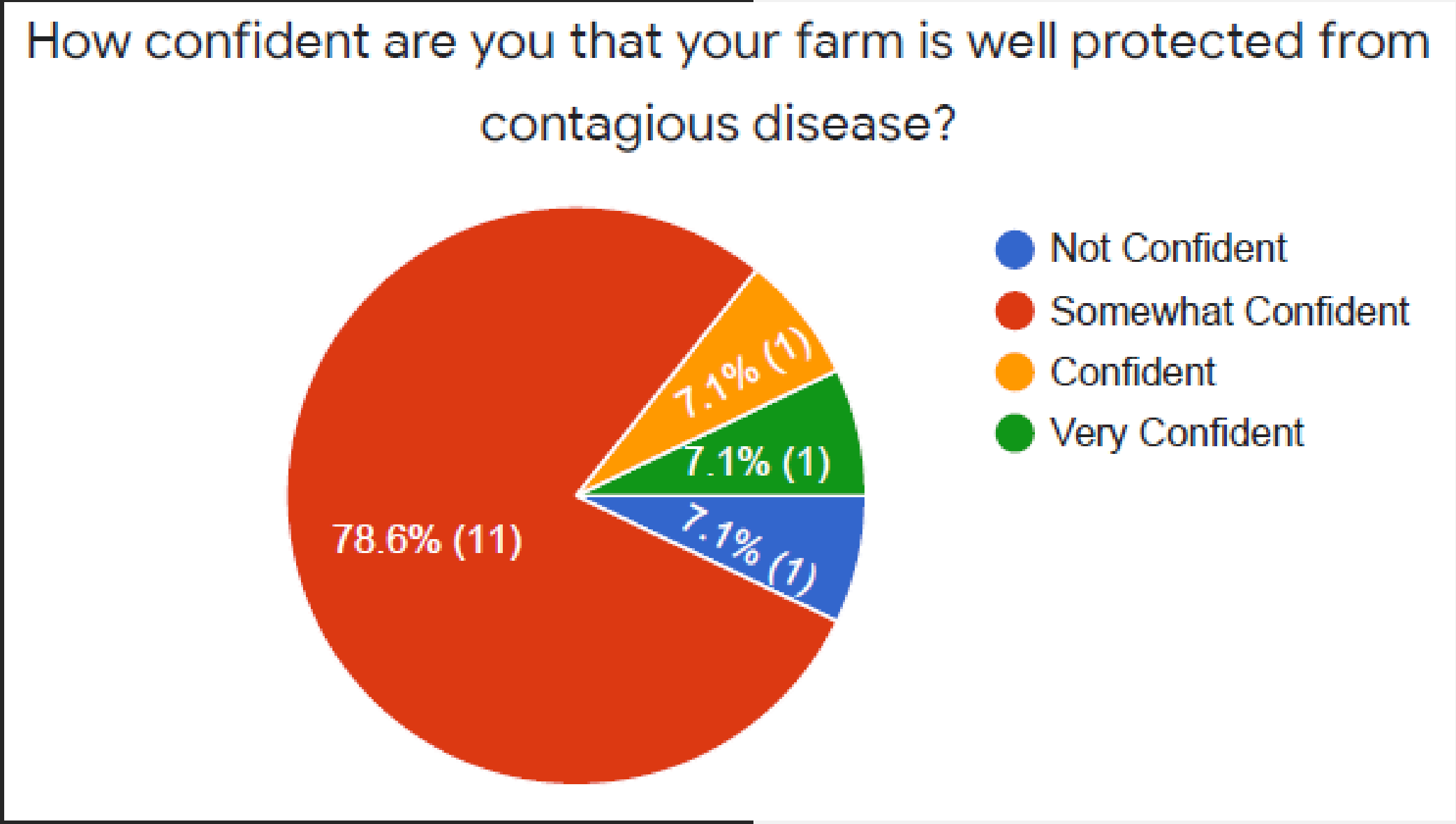


POLL

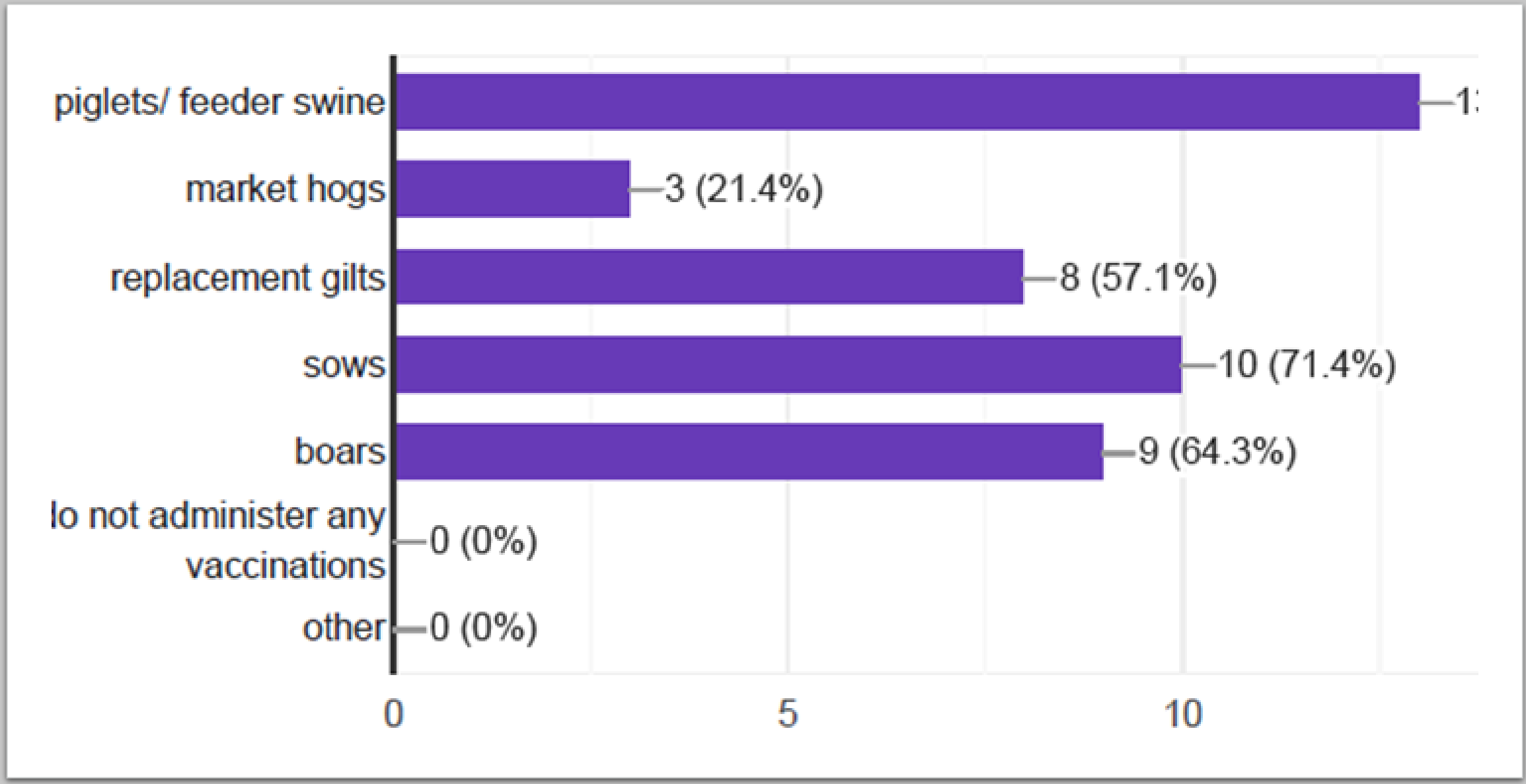
TRUE OR FALSE?

I DO NOT UTILIZE ALL BIOSECURITY PRACTICES I KNOW ABOUT

SARE Partner Farmer Biosecurity Reports



VACCINATIONS



What most strongly influences your herd vaccination choices?

A. My herd veterinarian

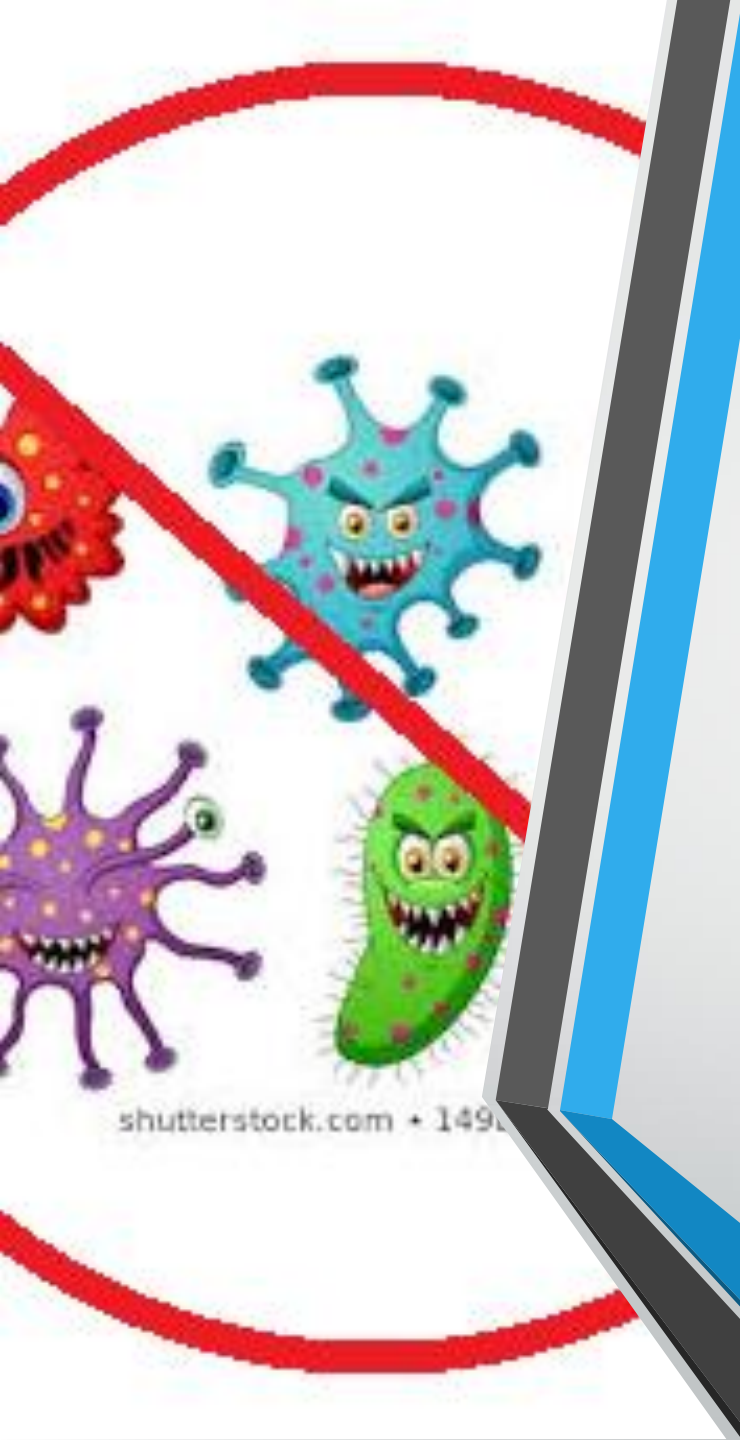
B. Experience with a disease outbreak on my farm

C. Advice from other farmers or industry groups

D. Online research

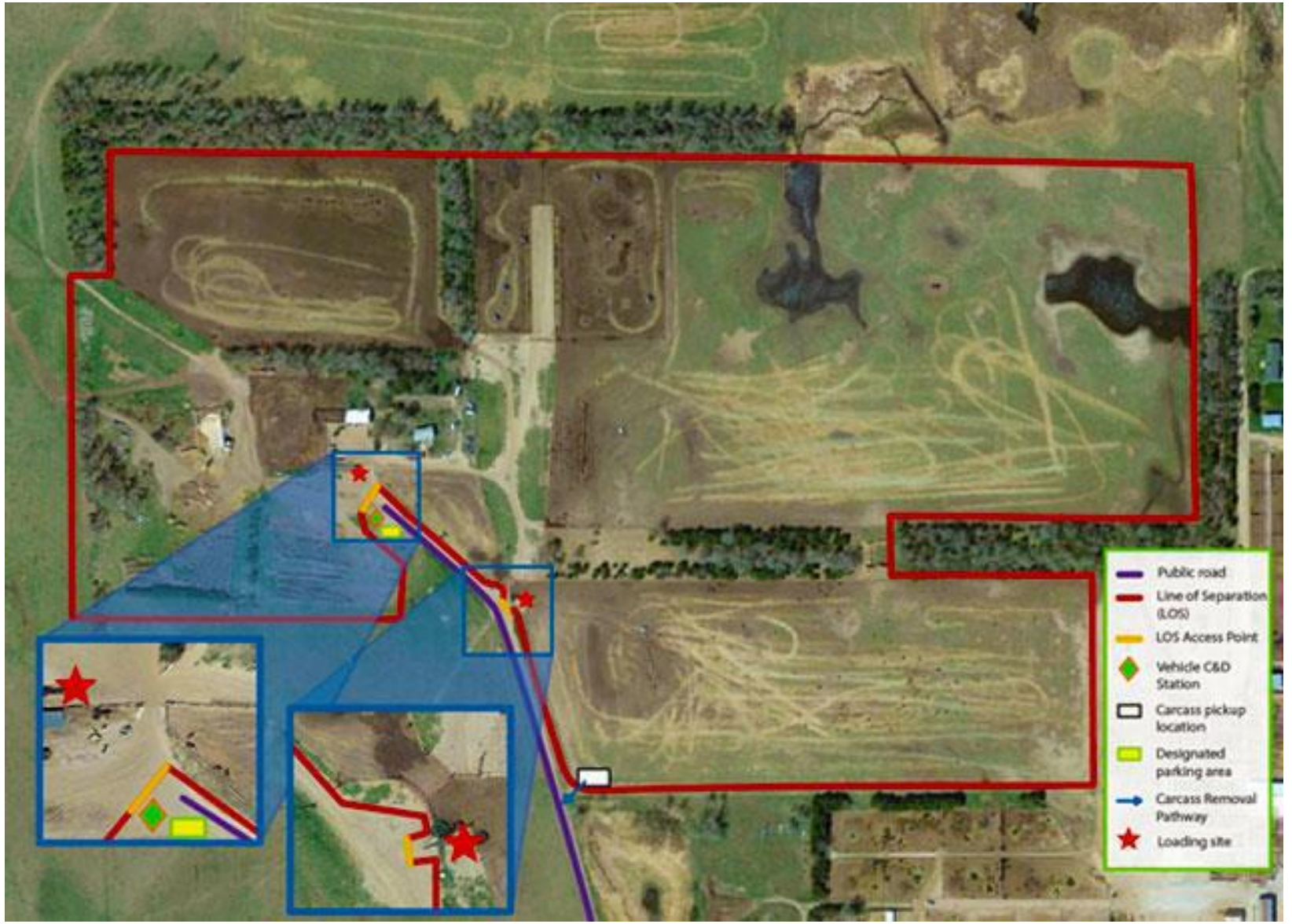
E. Other

What About Vaccines?



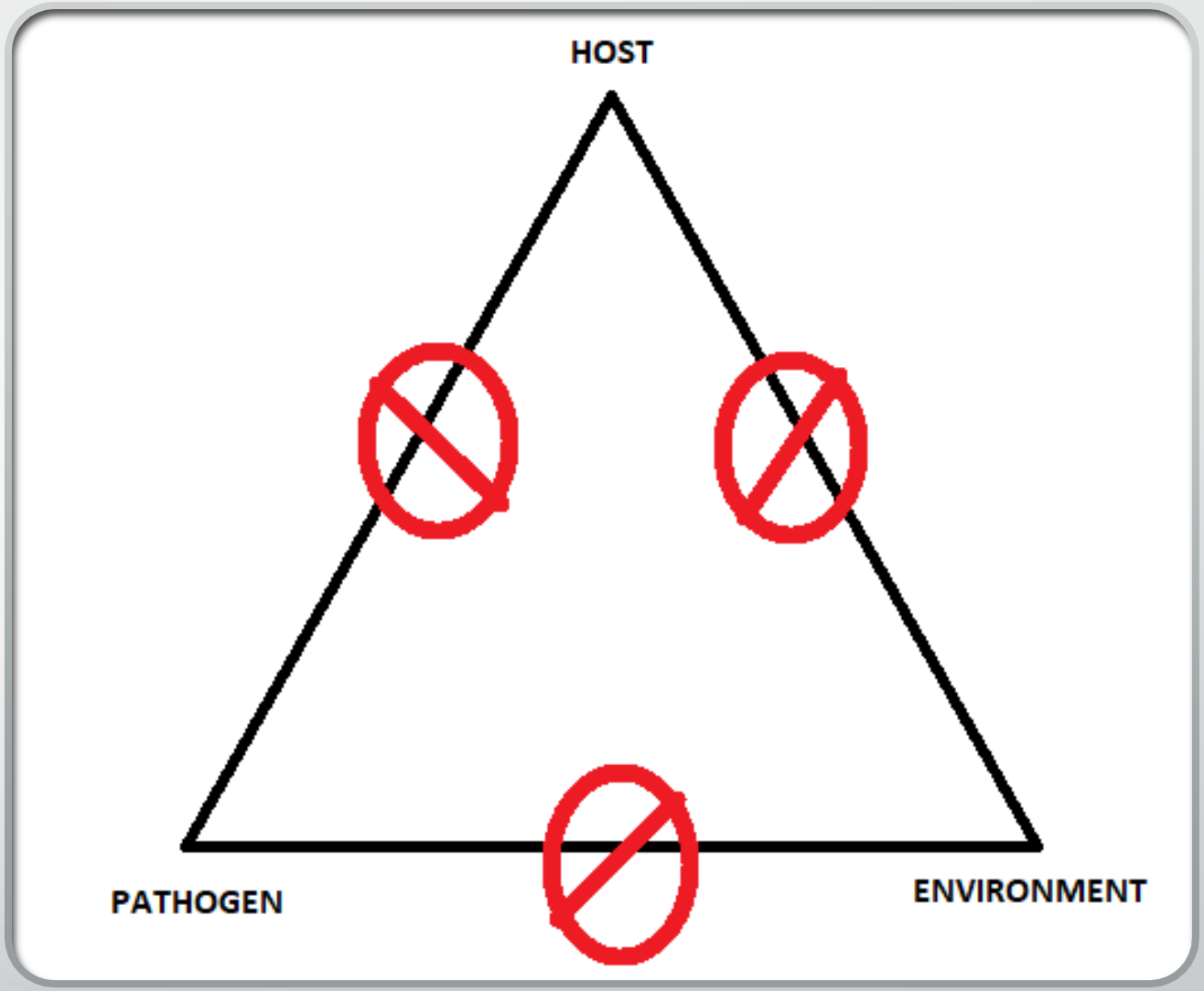
Biosecurity

- *Everything that's done to keep pathogens (viruses, bacteria, fungi, parasites and other microorganisms) – away from livestock, property, and people.*
- *This includes:*
  - **Structural biosecurity**
  - **Operational biosecurity**


Public road
Line of Separation (LOS)
LOS Access Point
Vehicle C&D Station
Carcass pickup location
Designated parking area
Carcass Removal Pathway
Loading site

Dynamics of Pathogen Spread

- Disrupt the transmission cycle with biosecurity
- What's the goal?
  - Limit exposure
  - Prevent spread of pathogens
  - Community Obligation?
  - Farm specific



Source: USDA NVAP Module 4: Preventing Disease Introduction and Spread

Pathogen Spread

Transmission Routes

- Oral
- Direct Contact
- Fomites (indirect contact)
- Aerosol
- Vector



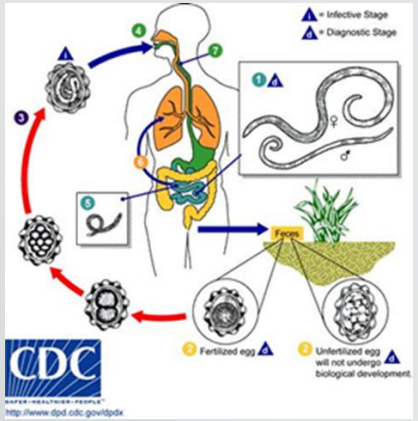




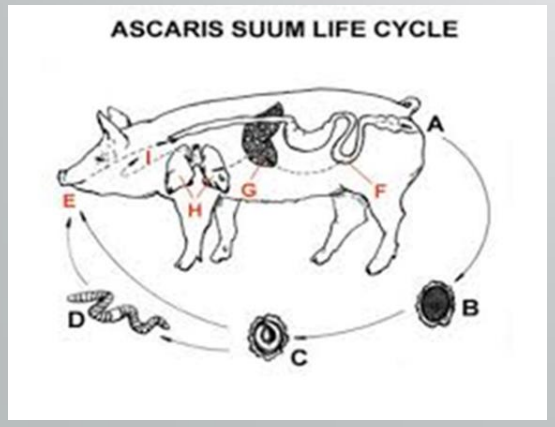



Interrupting Transmission Routes

- Direct Contact → Nose to nose contact, contact with a mucosal surface, broken skin barrier
- Aerosol transmission → High density indoor housing, coughing, sneezing
- Effective Biosecurity Prevention Tools:
  - Quarantine
  - Age/ phase segregation
  - Sick animal segregation
  - Closed herd of known status



Interrupting Transmission Routes



- **Oral transmission :**
  - Contaminated feed
  - Fecal-oral
  - Oral/nasal fluids, direct and indirect

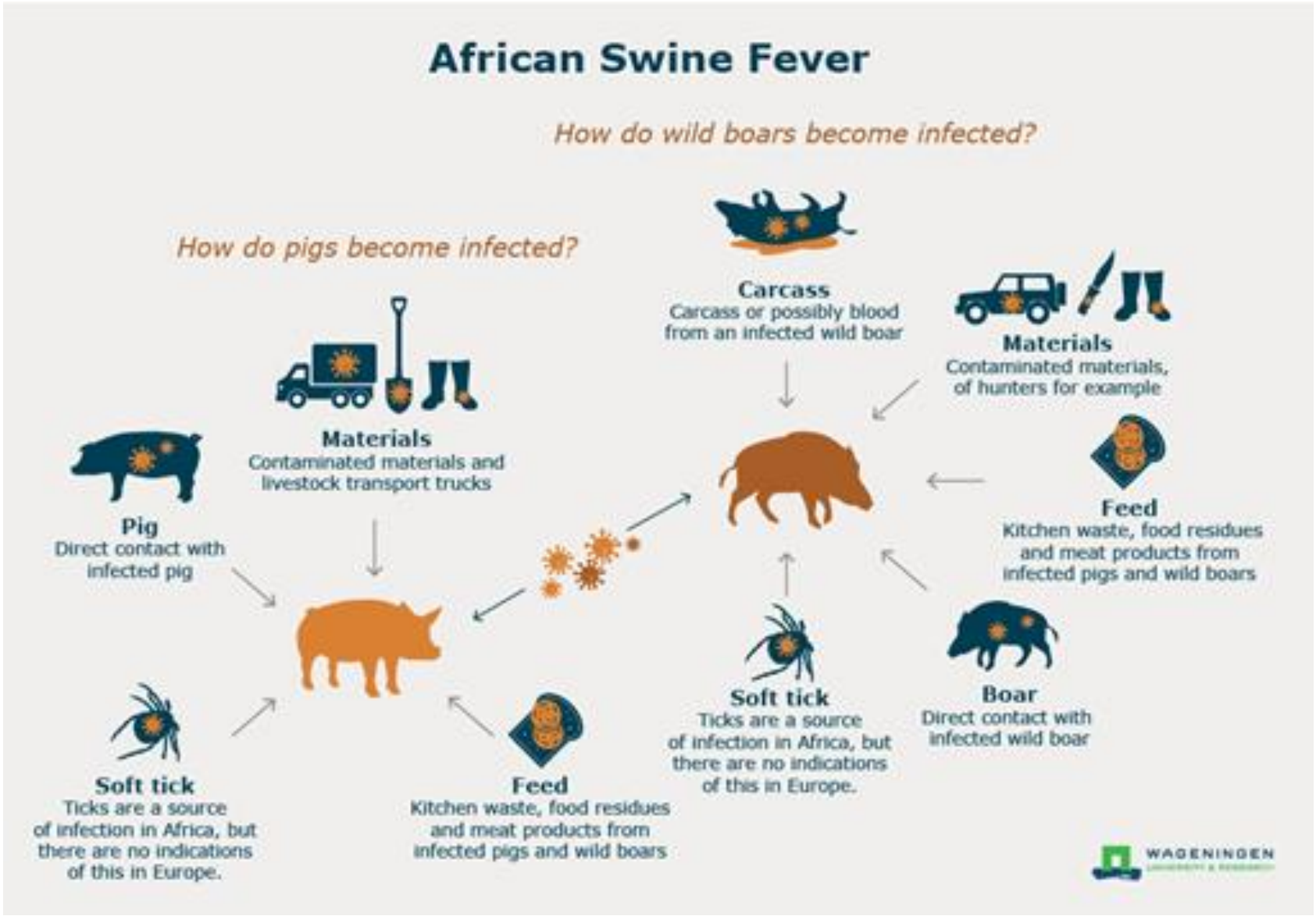
- **Effective Biosecurity Prevention Tools:**
  - Sanitation
  - Proper feed storage
  - Proper feed quality
  - Quarantine

Interrupting Transmission Routes

- FOMITES→
  - Feed Truck
  - Trailers
  - Tractors
  - Boots/clothing
  - Dirty hands
- Effective Biosecurity Prevention Tools:
  - Sanitation
  - Duplicate equipment
  - Flow of traffic
  - Limiting Visitation

Interrupting Transmission Routes

- **VECTORS**
  - Biting flies, mosquitoes, ticks
  - Wild birds
  - Rodents
- **Effective Biosecurity Prevention Tools:**
  - Sanitation
  - Limit access!
  - Rodent control program


African Swine Fever
How do wild boars become infected?
How do pigs become infected?
Carcass
Carcass or possibly blood from an infected wild boar
Materials
Contaminated materials, of hunters for example
Feed
Kitchen waste, food residues and meat products from infected pigs and wild boars
Boar
Direct contact with infected wild boar
Soft tick
Ticks are a source of infection in Africa, but there are no indications of this in Europe.
Feed
Kitchen waste, food residues and meat products from infected pigs and wild boars
Soft tick
Ticks are a source of infection in Africa, but there are no indications of this in Europe.
Materials
Contaminated materials and livestock transport trucks
Pig
Direct contact with infected pig
WAGENINGEN

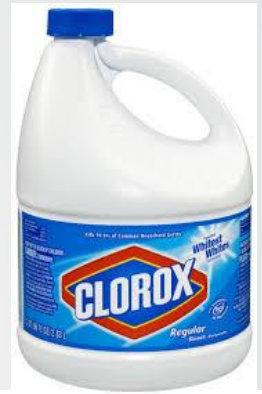
Let’s take a quick break …

Biosecurity Practice

- **Sanitation**
- **Farm Protocols**
- **Quarantine**

Types of disinfectants

- **Bleach: Almost everything**
  - **Corrosive and toxic (people and fish)**
- **Iodine Compounds: Decent**
  - **Stains, corrosive, toxic**
- **Detergents (Roccal-D, laundry…)**
  - **Pleasant, not always effective**
- **Virkon S, Nolvasan and others: Effective**
  - **Low toxicity, low corrosion**



Animal management and safety

Quarantine	Quarantine new arrivals and those animals returning from a fair.
Use	Use separate equipment for healthy and sick animals.
Don't	Don't borrow tools or equipment from other farms.
Boots	Keep separate boots for use on your farm and around your animals.
Look	Look for signs of infectious diseases. Ask your veterinarian what diseases are present in your area
Discuss	Discuss inoculations.
Report	Report sick animals.

What are Carrier Pigs?

- Number ONE route of disease introduction to a herd via:
  - Direct contact
  - Aerosol
  - Oral
  - Fomite

- Animal Management:
  - QUARANTINE
  - DISEASE SURVEILLANCE TESTING
  - HERD HISTORY
  - VACCINATION

Biosecurity: Quarantine

- Why: Isolation
- When: during ***high risk periods***
  - Introduction to a herd
  - Return from exhibition
  - Sick pigs
- For how long?
  - Depends on the disease
    - *Incubation period*
    - *Carrier state*
  - 30-60 days (plus)

Biosecurity: Quarantine

- What constitutes a true quarantine?
  - Physical separation from pig herd and other livestock and wildlife
  - Aerosol separation
  - All in-all out
  - IDEAL: Disinfectable environment

Quarantine

- **Tips for successful Quarantine:**
  - Keep written records
  - Monitor
    - Signs of disease
  - Minimize contact with multiple people or always visit this group last
  - Separate
    - Clothes, tools, feeders, etc.
  - Wash hands on the way in and on the way out
  - Plan

Quarantine

- **Common mistakes:**
  - Short quarantine period
  - Allowing pigs back into the herd without quarantine
  - Fomites
  - Order of animal management: attend quarantined pigs last, then clean and disinfect
  - Incomplete separation
  - Breakdown of observation, documentation, communication

The top 3 barriers to biosecurity practice reported in the survey were:

-expense (57%)
-time consuming (21%)
-not knowing which recommendations are best for the individual farm (38%)

Which item is most expensive?

A. Disposable gloves

B. Extra pair of boots for farm use only

C. Rubber dish pan

D. Bleach

E. Scrub brush

F. Time spent using all the things above that you already bought

G. Respiratory diagnostics, in-feed medication, mortality losses, market losses, environmental mitigation, mortality disposal, replacement stock

Biosecurity to Control Infectious Diseases of Swine

(1) Swine Influenza (Swine Flu or SIV)

(2) Porcine Reproductive and Respiratory Syndrome (PRRS)

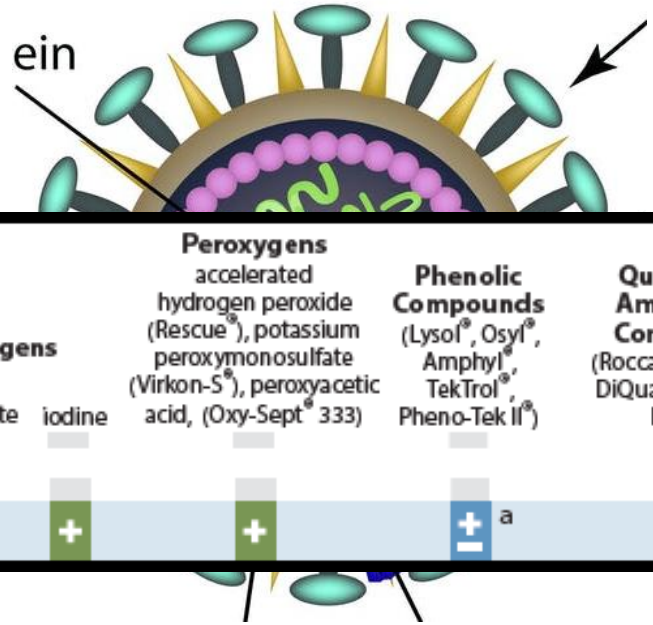
(3) Foreign Animal Diseases (FADs)

-Foot and Mouth Disease (FMD)

-African Swine Fever (ASF)

Swine Influenza a.k.a. “Swine Flu”

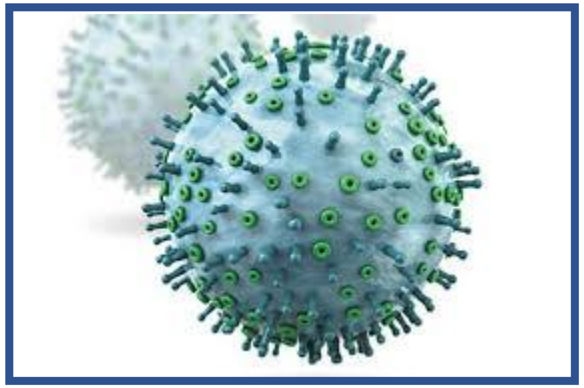
- Enveloped Virus
- Spread pig to pig through coughing (aerosol) and nasal discharge (direct contact, oral). Transmission through the herd is rapid (high *morbidity*)



susceptible	Acids: hydrochloric acid, acetic acid, citric acid	Alcohols: ethanol, isopropanol	Aldehydes: formaldehyde, paraformaldehyde, gluteraldehyde	Alkalis: sodium hydroxide, ammonium hydroxide, sodium carbonate	Biguanides: chlorhexidine, Nolvasan®, ChlorHex®, Virosan®	Halogens: sodium hypochlorite	Halogens: iodine	Peroxygens: accelerated hydrogen peroxide (Rescue®), potassium peroxymonosulfate (Virkon-S®), peroxyacetic acid, (Oxy-Sept® 333)	Phenolic Compounds: (Lysol®, Osyl®, Amphyl®, TekTrol®, Pheno-Tek II®)	Quaternary Ammonium Compounds: (Roccal®, Zepharin®, DiQuat®, Parvosol®, D-256®)
enveloped viruses	+	+	++	+	±	+	+	+	± a	±

- Quarantine of new or returning pigs - 30 days
- Cleaning and disinfection of pig environment
- Environmental control: exclusion of sick people and wild birds (“mixing vessel”)
- *Zoonotic* potential: influenza vaccination can reduce amount of virus in circulation

Porcine Reproductive and Respiratory Syndrome (PRRS)



- Virus of pigs, strains vary in their *virulence*

-

susceptible	**Acids** hydrochloric acid, acetic acid, citric acid	**Alcohols** ethanol, isopropanol	**Aldehydes** formaldehyde, paraformaldehyde, gluteraldehyde	**Alkalis** sodium hydroxide, ammonium hydroxide, sodium carbonate	**Biguanides** chlorhexidine, Nolvasan®, ChlorHex®, Virosan®	**Halogens** sodium hypochlorite	**Halogens** iodine	**Peroxygens** accelerated hydrogen peroxide (Rescue®), potassium peroxymonosulfate (Virkon-S®), peroxyacetic acid, (Oxy-Sept® 333)	**Phenolic Compounds** (Lysol®, Osyl®, Amphyl®, TekTrol®, Pheno-Tek II®)	**Quaternary Ammonium Compounds** (Roccal®, Zepharin®, DiQuat®, Parvosol®, D-256®)
enveloped viruses	+	+	++	+	±	+	+	+	± [a]	±

-

stillborn, weak or mummified piglets. Preweaning mortality may also be increased

- Disease control through biosecurity:
  - Extended quarantine of new or returning pigs with *surveillance testing* – 60 plus days
  - Purchasing only pigs from PRRS negative sources (including semen for AI)
  - Sanitation of environment and equipment

In the last 15 minutes, my understanding of Swine Influenza Virus has:

A. Increased

B. Decreased

C. Stayed the same

In the last 15 minutes, my understanding of Porcine Reproductive and Respiratory Syndrome (PRRS) has:

A. Increased

B. Decreased

C. Stayed the same

Foreign Animal Diseases (FADs): African Swine Fever (ASF) and Foot and Mouth Disease (FMD)

- United States Department of Agriculture (USDA) monitors for and
eign
ests
Stat
nima
U.S.
the economy and human health as w

- Introduction of FADs are best prevented through education, effective biosecurity practice and consistent animal health monitoring

55% of respondents report conducting routine necropsies on unexplained pig mortalities

Which animal is most likely to yield the best information from a post mortem exam?

A. The pig with the worst clinical signs that has been dead the longest

B. The pig that was sickest a week ago but looks better now

C. Any pig(s) from the sick group that is just starting to show the same signs you are concerned about but hasn't yet been treated

D. Any pig(s) from the sick group that you have started to treat already to save them

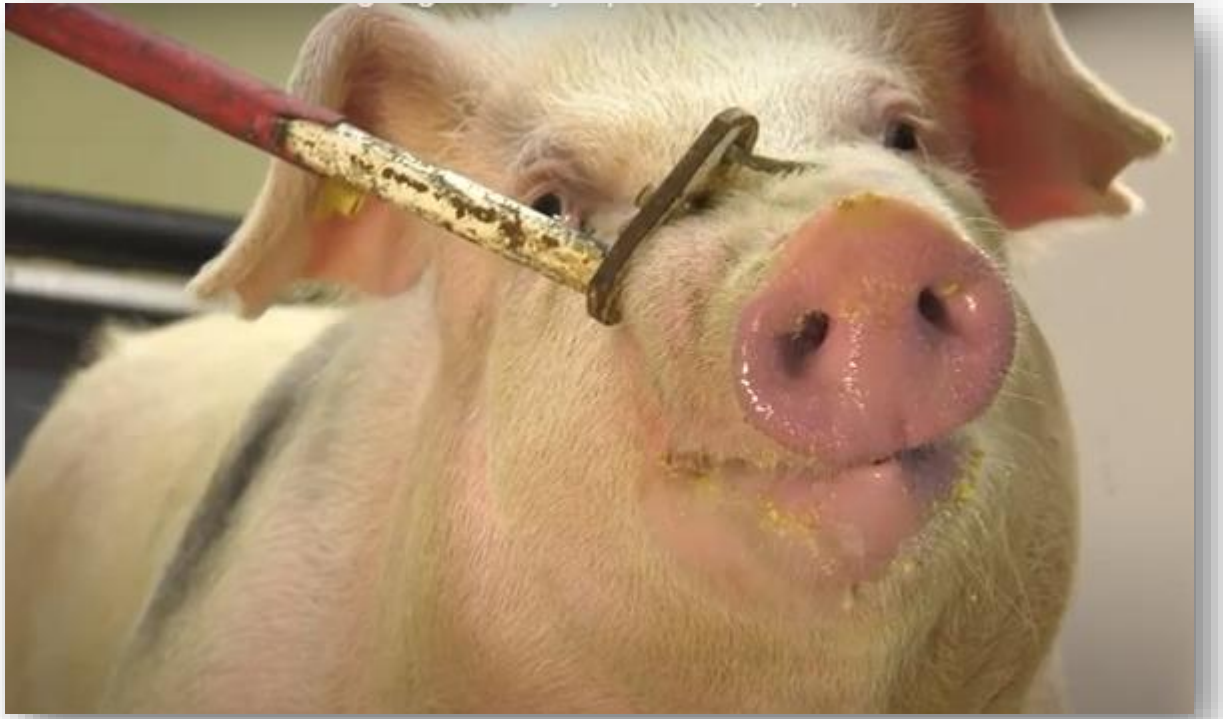
Next Steps…

- Consider this information as you outline your farm's biosecurity plan
  - *What do you think your farm's greatest transmission route risks are?*
  - *Where can you establish engineering controls?*
    - *TIP: look at a map of your farm and visualize "clean" vs "dirty" areas*
- On-site biosecurity evaluations will help us identify where we think your greatest transmission route risks are
- We will work together to make suggestions

Q & A

- The information presented today?
- The project?
- Finding a pig vet?

- We will contact all partner farmers to schedule a day to meet at your farm for herd sampling
  - Will follow prevailing CDC COVID 19 prevention protocols
  - Plan to visit 1 farm per week, thorough clean and disinfection between
    - Boots, car wash, coveralls, sampling equipment, humans



Thank you for tuning in!

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Sustainable Agriculture Research & Education

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  - Dairy, Livestock & Forage Crops Field Specialist
    - Elaina Enzien: Elaina.Enzien@unh.edu

Lawsonia intracellularis- “Ileitis”

- “Garden-hose gut” or PPE or NE
  - Bacteria that infects the intestinal cells of several mammals, including pigs
- Spread pig to pig through oral exposure to infected manure
  - Bacteria can be shed for a prolonged period of time (10 weeks)

susceptible	Acids: hydrochloric acid, acetic acid, citric acid	Alcohols: ethanol, isopropanol	Aldehydes: formaldehyde, paraformaldehyde, gluteraldehyde	Alkalis: sodium hydroxide, ammonium hydroxide, sodium carbonate	Biguanides: chlorhexidine, Nolvasan®, ChlorHex®, Virosan®	Halogens: sodium hypochlorite	Halogens: iodine	Peroxygens: accelerated hydrogen peroxide (Rescue®), potassium peroxymonosulfate (Virkon-S®), peroxyacetic acid, (Oxy-Sept® 333)	Phenolic Compounds: (Lysol®, Osyl®, Amphyl®, TekTrol®, Pheno-Tek II®)	Quaternary Ammonium Compounds: (Roccal®, Zepharin, DiQuat®, Parvosol®, D-256®)
gram-negative bacteria	+	++	++	+	++	+	+	+	++	+

- Disease control through biosecurity:
  - Sanitation: boots, coveralls, equipment
  - Reduce mixing of pig groups
  - Introduce new groups of pigs to a cleaned and disinfected environment
    - All in- all out (vs *continuous flow*)
  - Quarantine of returning pigs with surveillance testing for new pigs: 30 -120 days
  - Environmental control: exclude/ deter rodents and wildlife from pig management areas