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World Organisation for Animal Health
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Webinar on biosecurity preparedness

Friday, 22 September 2023

10. 00 AM Bangkok time

The webinar will cover

- ✓ Mentimeter session
- ✓ Safe and effective carcass disposal survey results
- ✓ Role of biosecurity, carcass disposal, and decontamination during an Animal Disease Response
- ✓ Environmental Implications of Improper Carcass Disposal
- ✓ Disposal Methods
- ✓ You will have opportunity to ask questions to the expert.

Key Speaker : Mr Gary Flory, Biosecurity and Carcass disposal specialist
Speaker: Dr Siti Hazar Mohammad, Department of Veterinary Services (DVS)
Moderator: Dr Ashish Sutar, World Organisation for Animal Health (WOAH)

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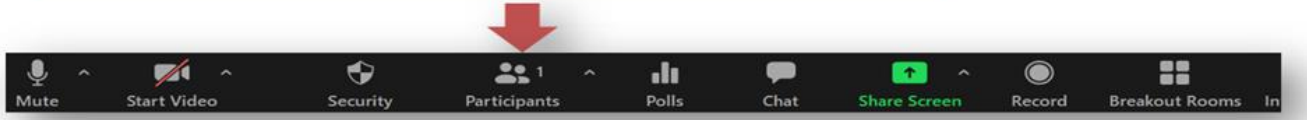
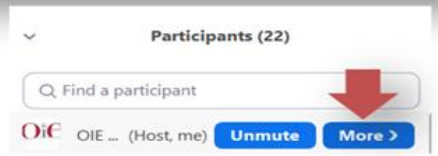


Hover your name and click on 'More'



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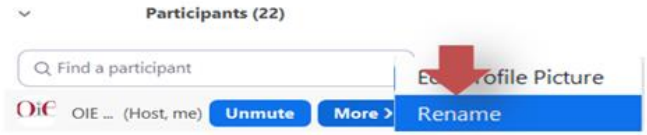

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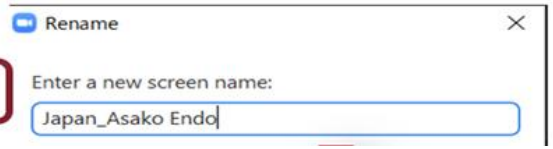
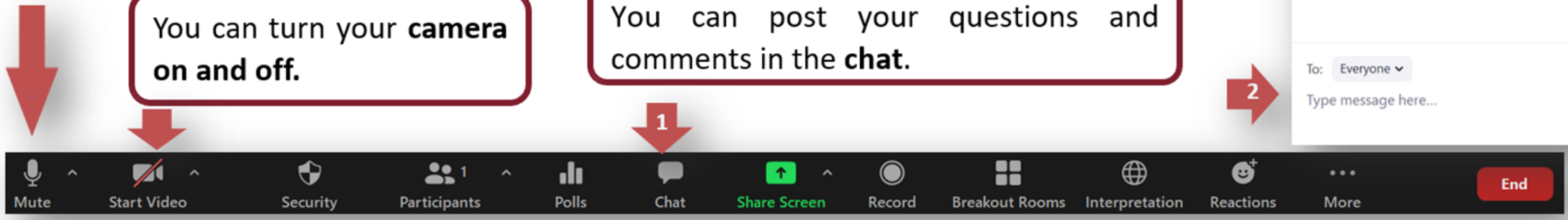


Please keep your **microphone muted** when you are not speaking.

You can **mute/unmute** yourself.

You can turn your **camera on and off.**

You can post your questions and comments in the **chat.**



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Agenda

10.00 : Webinar start
10.02 : Dr Ronello Abila, WOAH SRR SEA welcome remark
10.07 : Dr Rohaya Mohd Ali, DDG Veterinary Public Health Division, DVS opening remark
10. 12: Mentimeter session
10.20 : Quick Project overview by Dr Ashish Sutar, DVS
10.25 : Carcass disposal Survey results Dr Siti Hazar, DVS and Gary Flory A and Q &A
10.40 : Role of biosecurity , Environmental Implications of Carcass Disposal, disposal methods by Gary Flory
11.20 : Q & A and Mentimeter
11.30 : Close of the webinar

World Organisation for Animal Health
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Project and activity brief

Ashish Sutar

Friday, 22 Sept 2023

Project brief

Enhance capacity of countries in South-East Asia to detect, control and prevent the spread of priority TADs

Project period: March 2019 - April 2025

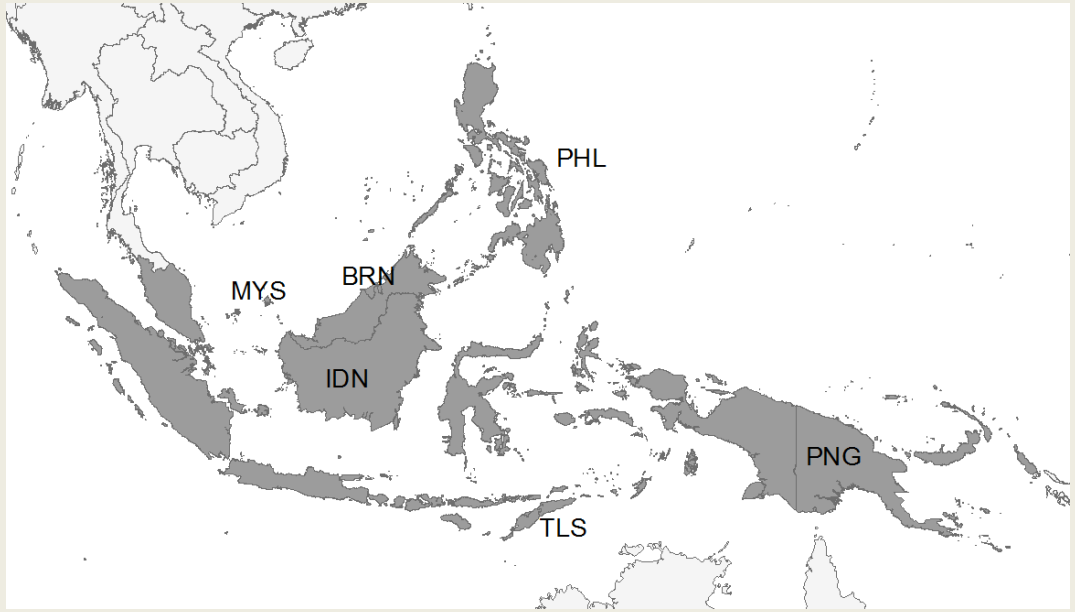
Implemented by : World Organisation for Animal Health (WOAH)

Funded by :

Department of Agriculture, Fisheries, and Forestry and (DAFF) formly known as Department of Agriculture, Water and Environment (DAWE).

Project target and pillars

6 targeted countries:
Brunei, Indonesia, Malaysia, Papua New Guinea , the Philippines, and Timor Leste.



Training, regional coordination activities, applied research and implementation of activities (amongst others) identified by the Veterinary Services in the target countries.

- ❑ Risk analysis
- ❑ Disease surveillance
- ❑ Emergency preparedness and response
- ❑ **Disease prevention activities**

Objectives

Baseline study and need analysis (Phase I)

1. Assess the effectiveness of existing methodologies and approaches.
2. Challenge their impact and draw lessons learned.
3. Ensure that previously successful work be continued, duplications avoided and inform the Projects' future approach. and activities.

Technical capacity development (Phase-II)

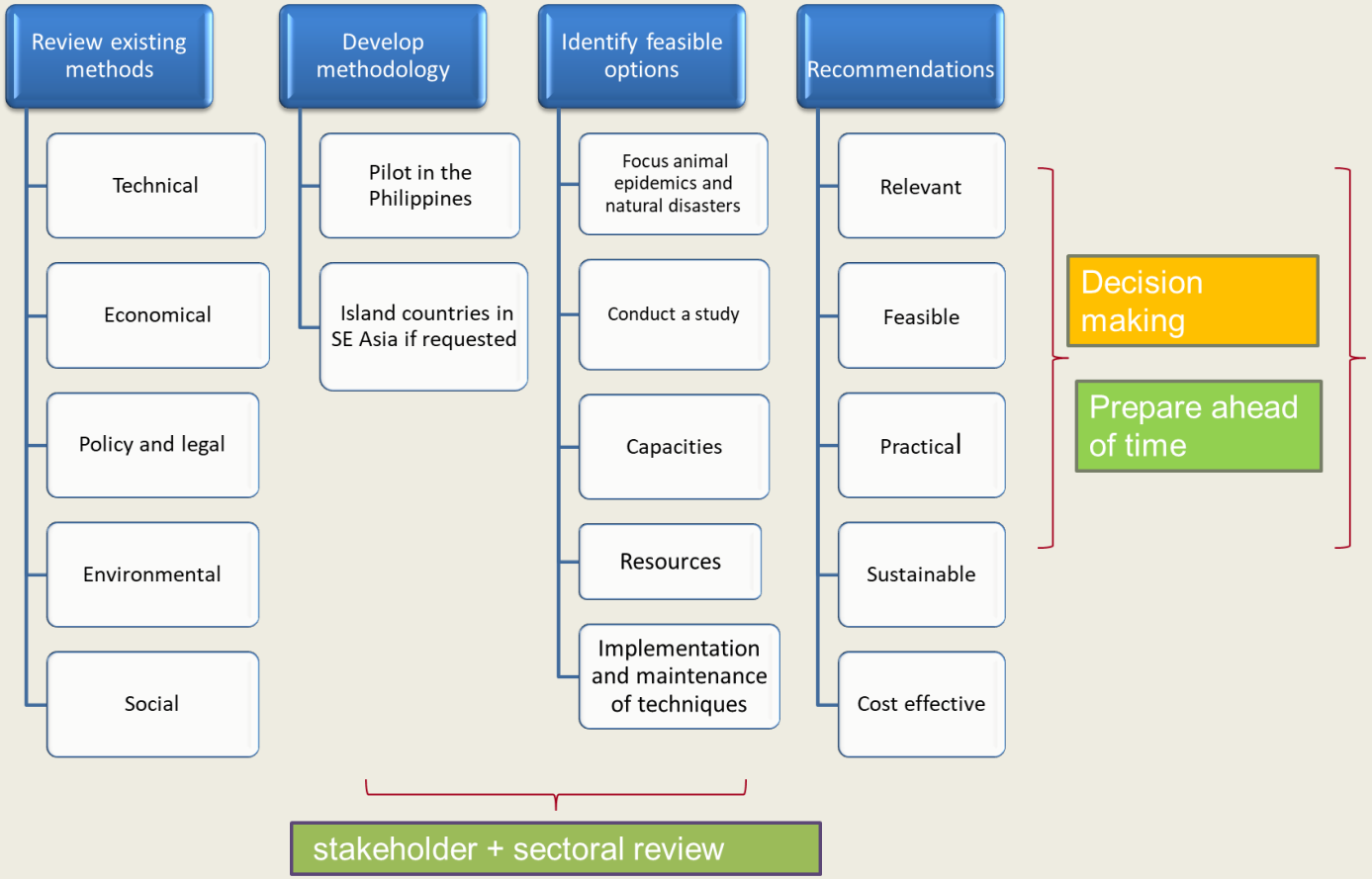
1. Improve knowledge in the prevention and control of TADs in target countries.
2. Strengthen Veterinary Services' capability to prevent, detect and control priority animal diseases.

Objectives of the overall Project

1. **Enhance VS capacity to undertake surveillance, risk analysis, biosecurity, emergency preparedness and response and disease control and prevention for TADs in target countries.**
2. Improve regional coordination for TADs risk management in South-East Asia
3. Assist target countries to have a better understanding of the risks associated with the spread of TADs and take appropriate action.
4. enhance inter-sectoral collaboration between Veterinary Services and the private sector in target countries.

Reduce the risks associated with TADs to animal health in South -East Asia and Australia, by strengthening capabilities of Veterinary Services in the selected target countries and improving regional coordination on TAD management in SE Asia.

Safe and effective carcass disposal



Safe and effective carcass disposal

Methodology is developed

- Philippines (2022)

Report with recommendation submitted to BAI.

- Timor Leste (2022)

- Consultation with stakeholders
- Introductory training organised (Role of 3 D during TAD response, Environmental Implications of Carcass Disposal, Carcass Disposal Methods and Biosecurity during Disposal Activities).

- Malaysia

- Survey results
- Report with recommendation due for submission to DVS.

Safe and effective carcass disposal

Dr Siti Hazar

Animal Disease Control and Zoonosis Section, Disease Control and Biosecurity Division

Department of Veterinary Services (DVS) Putrajaya

Introduction

Carcass disposal activities can spread transboundary animal disease, environmental impact and adverse public health effects.

Carcass disposal should be carried out as the final step in diseases control procedures.

Issues such as the number of animals involved, biosecurity's measures, risks, equipment, safety, environmental pollution and emotional stress of animal owner are often encounter during this procedur

Guideline for carcass and product disposal = ‘APTVM Penghapusan, Pelupusan dan Pemusnahan haiwan dan Produk Haiwan.

Malaysia method : burial/ burning (incineration)

Feasibility Study Introduction

This project begin with initial planning meeting between WOAH and Malaysia

Dr Siti Hajar Nor Muhammad as national Focal Point, Supervise by Dr Sarah Dadang Abdullah , consult by Mr Gary Flory from United States and WOAH Project Coordinator is Dr Ashish Sutar.

The workplan of this study was established in consultancy agreement between WOAH and Mr Gary.

The project was started from Jan 2023 to Sept 2023 as a final data presentation.

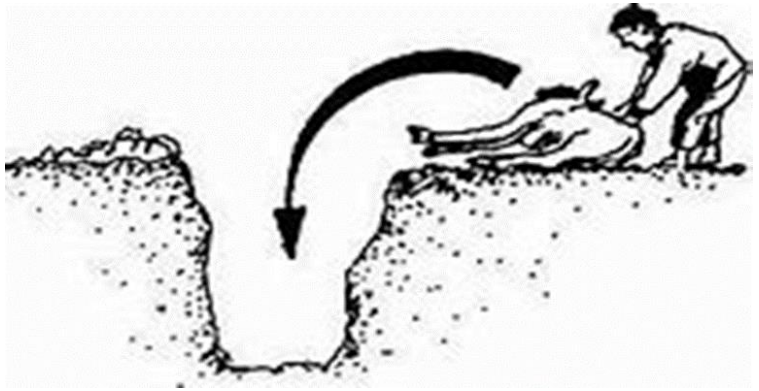
Objectives

- Feasibility study objective is reviewing existing methods and assess technical, economic, policy, environmental, and sociocultural feasibility of more effective methods.
- Survey objective is to identify current practices, attitudes, gaps, and opportunities in carcass management.
- Provide practical, relevant, and feasible recommendations for safe and effective carcass disposal.

Planning

Following the meeting, the National Focal Point has provided the consultant a list of relevant stakeholder and technical resources and were discussed during the inception and follow up meetings.

The survey question have been discussed together and translated into Bahasa Malaysia and Chinese languages by Malaysia team before distributed to the participants. Unfortunately, the survey in Mandarin language was unable to be carried out in google form due to some technical error.



Methodology

n=154 survey responses received

- Data Collection
- Documents and texts
- National Focal point have provided the summary of Malaysia Carcass Disposal Guideline ‘APTVM Penghapusan, pelupusan dan pemusnahan Haiwan dan Produk’.
- A slot of discussion on method of how Malaysia handle the carcass disposal during outbreak or Natural disaster.

Survey Results

Seksyen B/ Section B

PENGETAHUAN TENTANG PELUPUSAN KARKAS

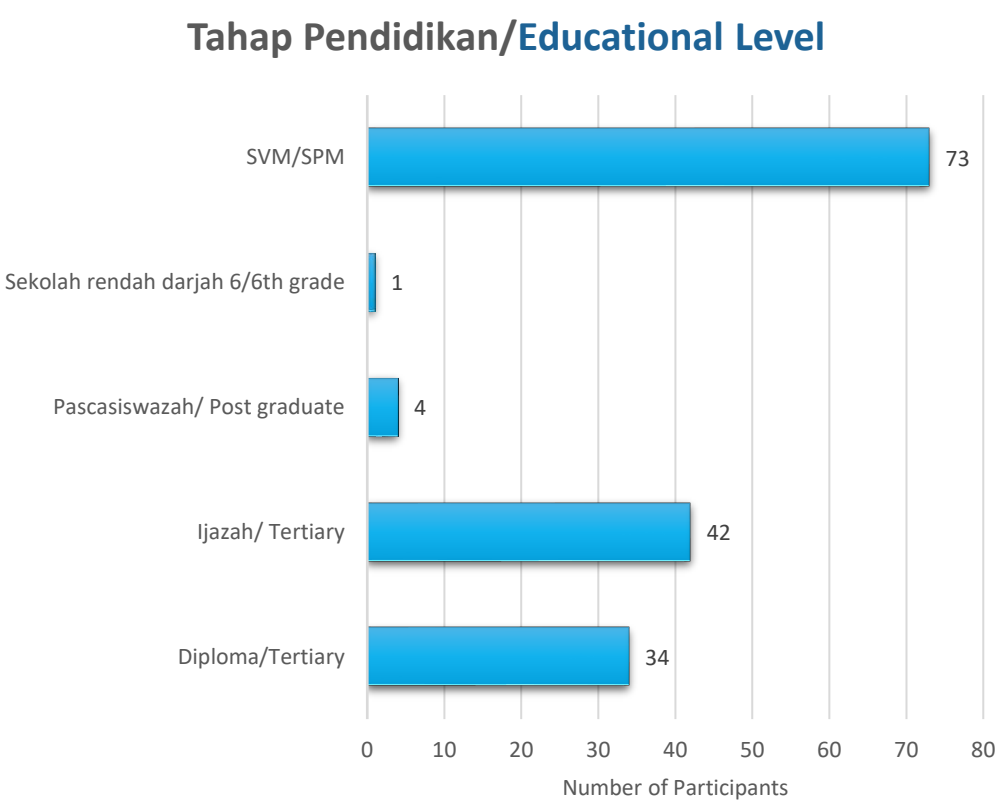
KNOWLEDGE ON CARCASS DISPOSAL

1.	Pernahkah anda terlibat dalam operasi mengawal wabak penyakit haiwan seperti Demam Babi Afrika, Selesema Burung, atau Penyakit Mulut dan Kuku? Have you been involved in the response to animal diseases outbreaks such as African Swine Fever, avian influenza, or Foot and Mouth Disease?	[ ] Ya/Yes [ ] Tidak/No
2.	Jika ya, melibatkan penyakit/wabak apa? If yes, which disease/diseases?	[ ] Demam Babi Afrika /African Swine Fever [ ] Selesema Burung / Avian Influenza [ ] Penyakit Kaki dan Mulut / Foot and Mouth Diseases [ ] Demam Babi Klasik/ Classical Swine Fever [ ] Antraks [ ] lain-lain sila nyatakan / Others, please specify: _____
3.	Jika ya, apakah anda terlibat dalam pelupusan bangkai haiwan?	[ ] Ya/Yes [ ] Tidak/No

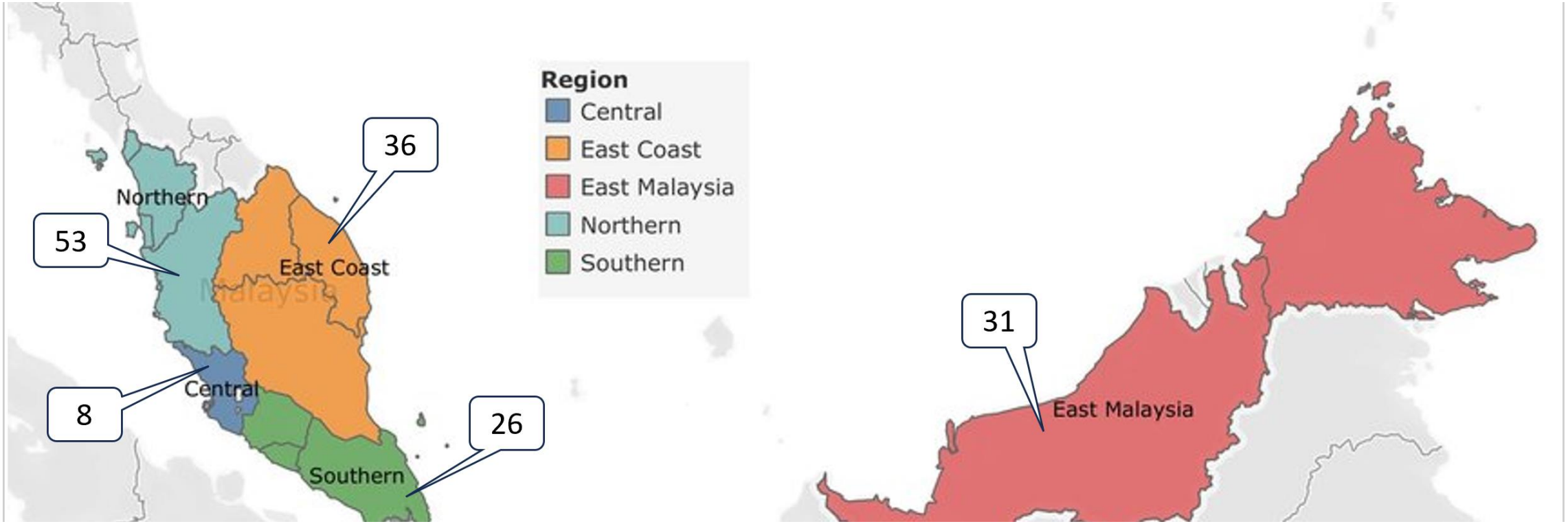
Feasibility Study Survey Results

COMPREHENSIVE AND INCLUSIVE SURVEY COMPLETED BY 154 STAKEHOLDERS

Biographical Information



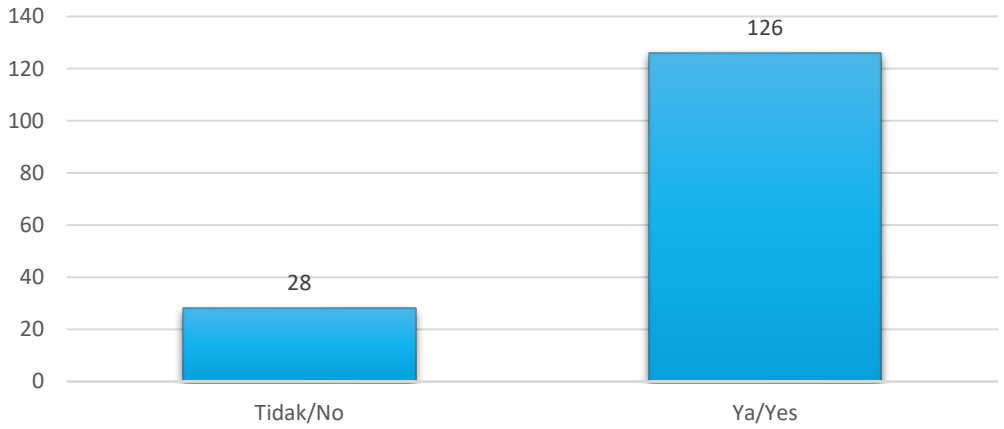
- Age of Participants: Spans from 21 to 58
  - Average of 37
- Gender: 62% male and 38% female
- Ethnicity: Many Malay but also a diverse group that affiliate with 13 other ethnic groups
- Education: Highly Educated
- Work: Veterinarian assistants, veterinarians, and similar professions
- Work Experience: Less than a year to 37 years
  - Average of 11 years


Region
Central
East Coast
East Malaysia
Northern
Southern
36
53
8
26
31
Northern
East Coast
Central
Southern
East Malaysia

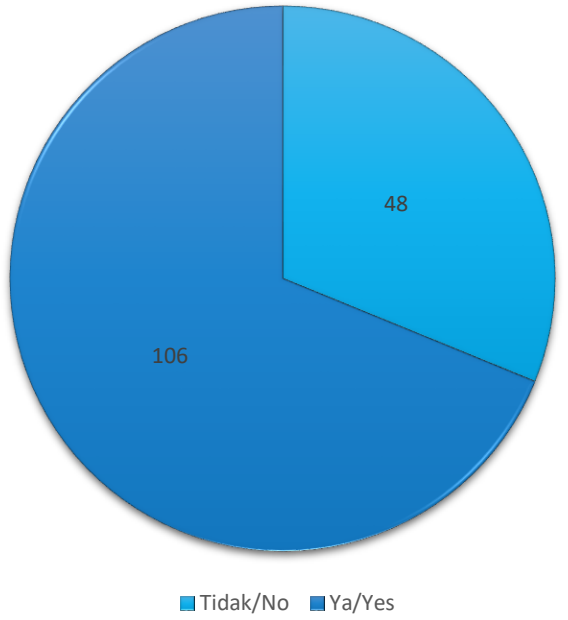
Regions

Response experience

Pernahkah anda terlibat dalam operasi mengawal wabak penyakit haiwan seperti Demam Babi Afrika, Selesema Burung, atau Penyakit Mulut dan Kuku?
Have you been involved in the response to animal diseases outbreaks such as African Swine Fever, avian influenza

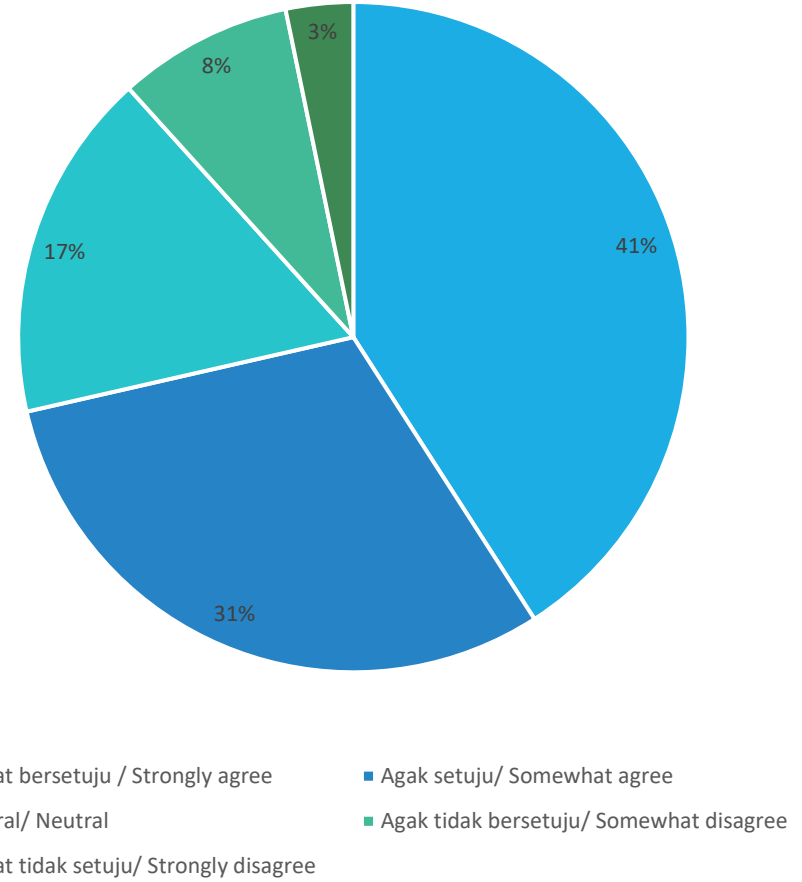


Jika ya, apakah anda terlibat dalam pelupusan bangkai haiwan? If yes, were involved in the disposal of animal carcasses?



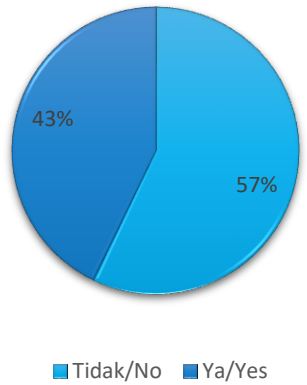
Role of Carcass Disposal during a Disease Response

All Participants: Pada pendapat anda aktiviti pelupusan bangkai boleh menghalang keberkesanan tindak balas terhadap bencana alam atau wabak penyakit haiwan yang besar? Can carcass disposal activities can impede the the response?

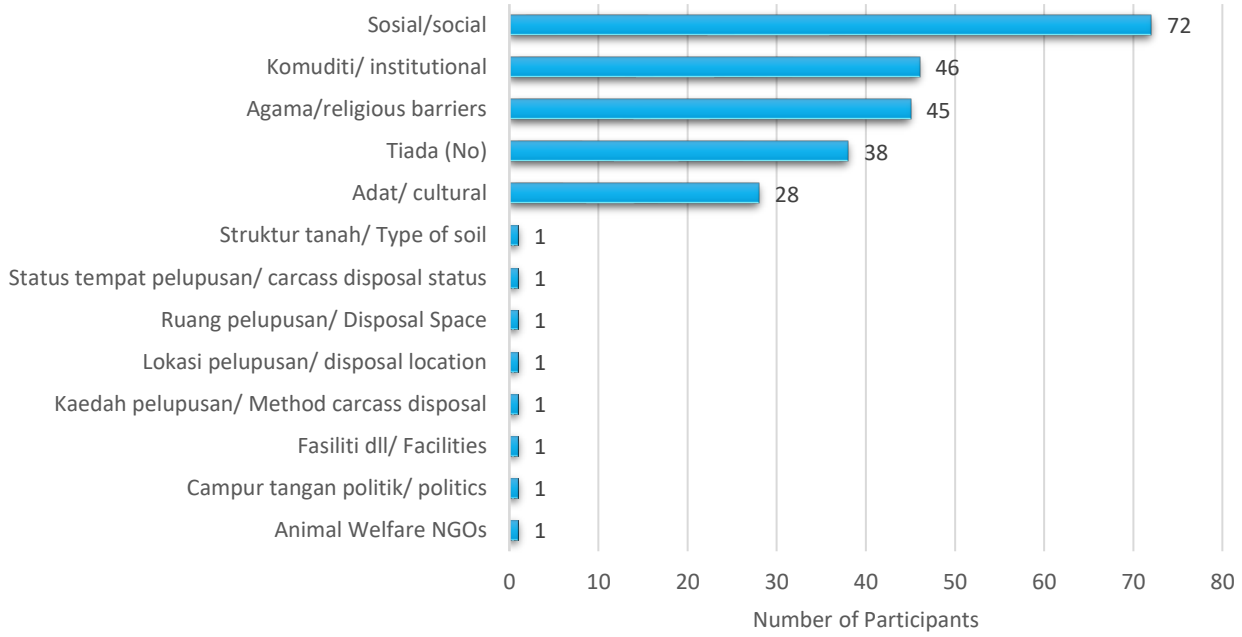


Social, Cultural, Institutional, or Religious Barriers

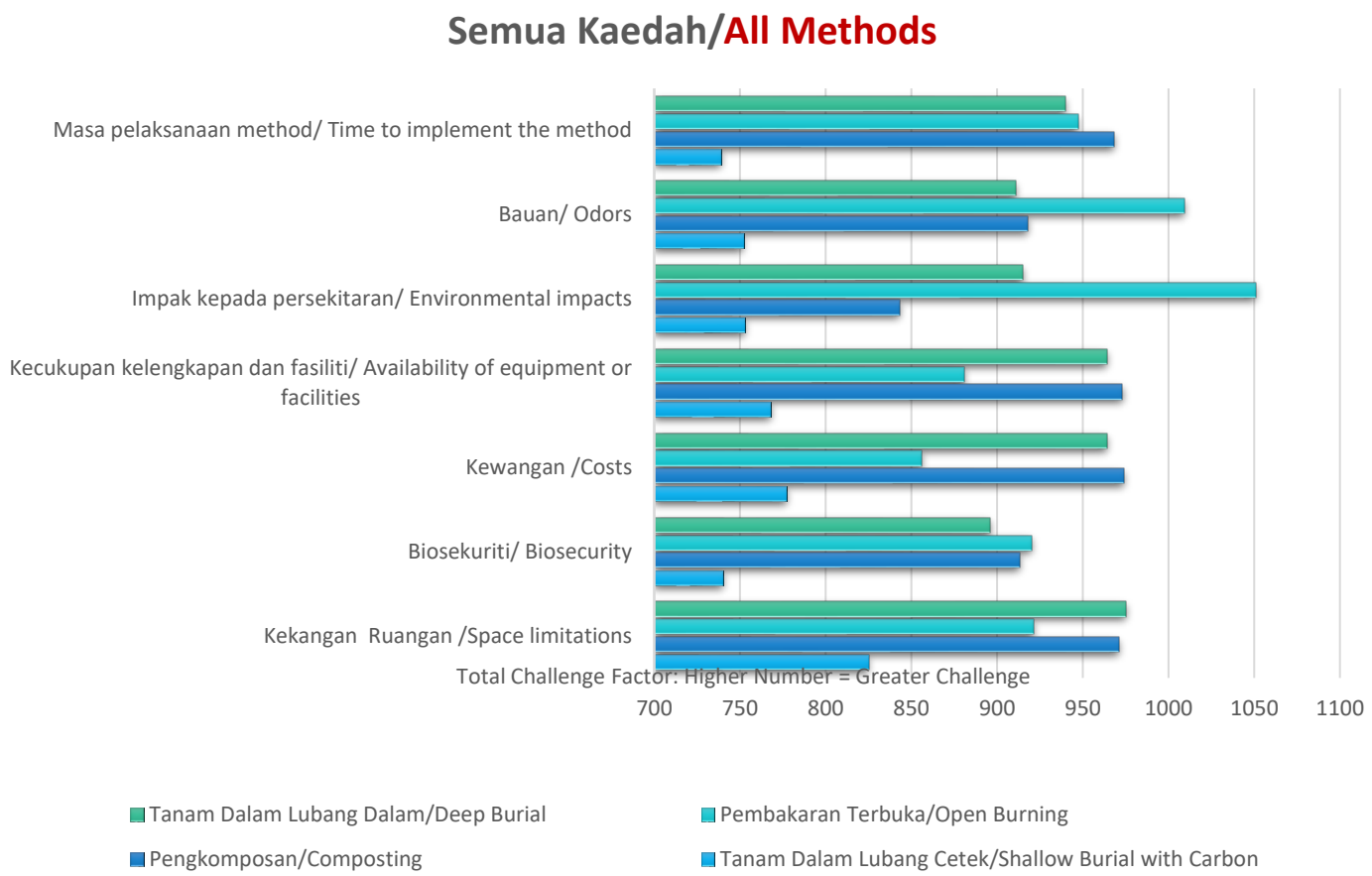
Adakah terdapat sebarang halangan sosial, budaya, institusi atau agama yang berkaitan dengan pelupusan bangkai haiwan di Malaysia?
Are there any social, cultural, institutional, or religious…



Jika ya, apakah jenis halangan berkenaan? If yes, what are they?

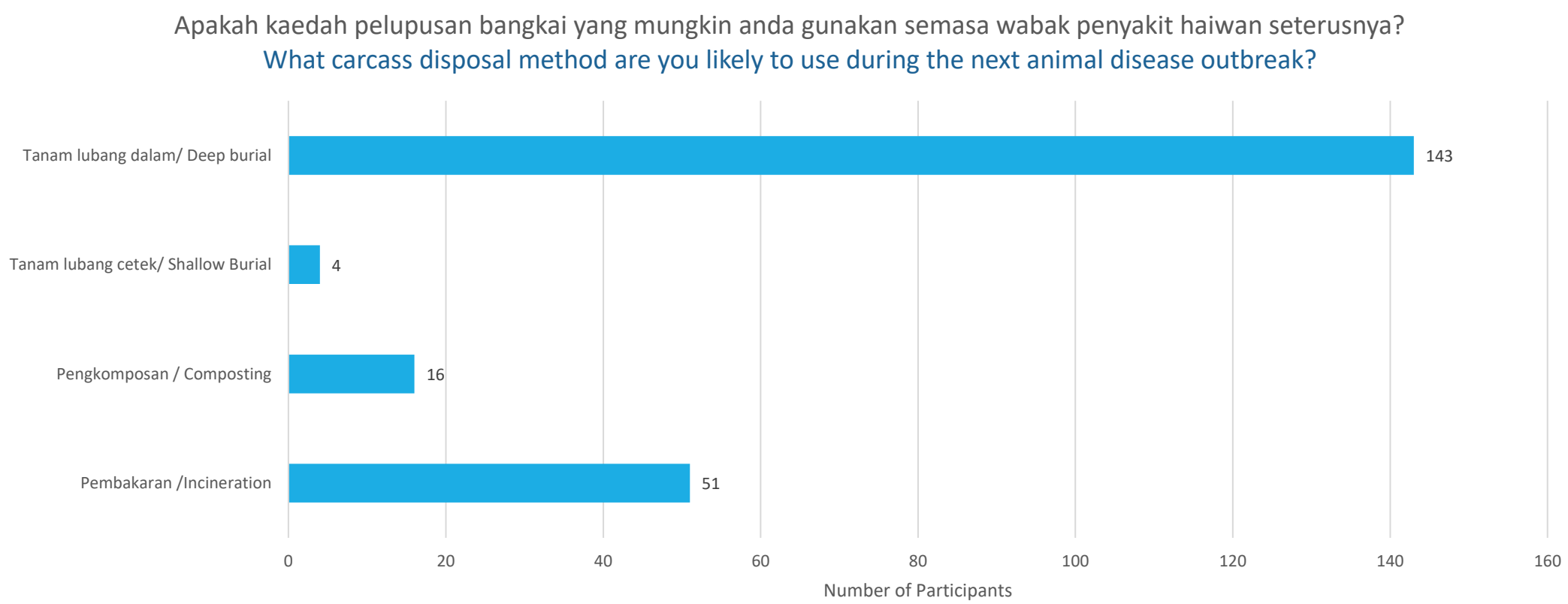


Evaluating the Challenges Associated with Each Carcass Disposal Method



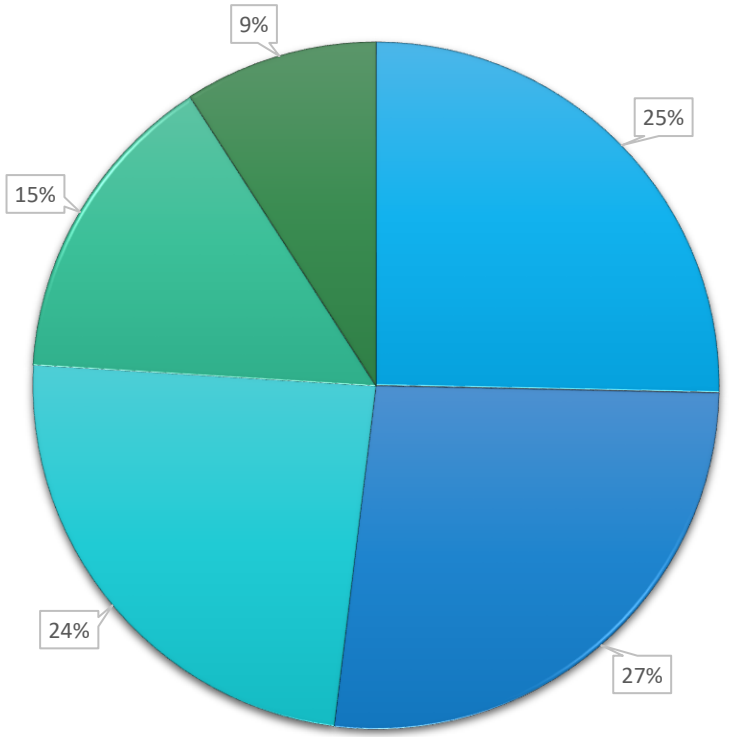
- Rank the severity of the challenges associated with:
  - Time to implement
  - Odors
  - Environmental impact
  - Equipment availability
  - Cost
  - Biosecurity
  - Space required

Carcass Disposal Method Likely to Be Used



Position on Off-Site Disposal

Apakah pendapat anda tentang pelupusan karkas di luar kawasan wabak atau pelupusan secara berpusat?
What is your position on the off-site or centralized disposal of animal carcasses?



Reasons for this Position

FOR CENTRALIZED DISPOSAL

- May be accepted as more economical and safe
- Saves time, space, and energy
- Speeds up farm restocking
- More systematic
- Prevent contamination
- Does not disturb the public

OPPOSED TO CENTRALIZED DISPOSAL

- High cost
- Environmental Pollution
- It is better on-farm to prevent the spread of disease.
- Biosecurity
- May spread disease
- Movement of carcasses spreads disease

Filling Gaps

Get help from other agencies

Disposal instructions must be clear

Provide the facilities and staff necessary for disease control

Identify specific places for carcass disposal

Training courses/workshops

Provide awareness to the community on proper carcass disposal

Strengthen the workforce

Conduct simulation exercises

Form a carcass disposal team

Other Comments

Revise SOPs
Awareness for farmers of the dangers of improper carcass disposal
Ask other agencies for sufficient equipment and supplies for disposal
Organize more courses and awareness of the issues
Privatize
Reporting livestock deaths
Incineration centers

Role of Biosecurity, Disposal, and Decontamination during a TAD response

Important Facts

60% of the 1,461 human diseases are due to pathogens that move across species lines

75% of all new emerging human infectious diseases are zoonotic - Most originate in wildlife

Environmental factors influence the emergence of new disease

Zoonotic Disease's Annual Impact on Humans

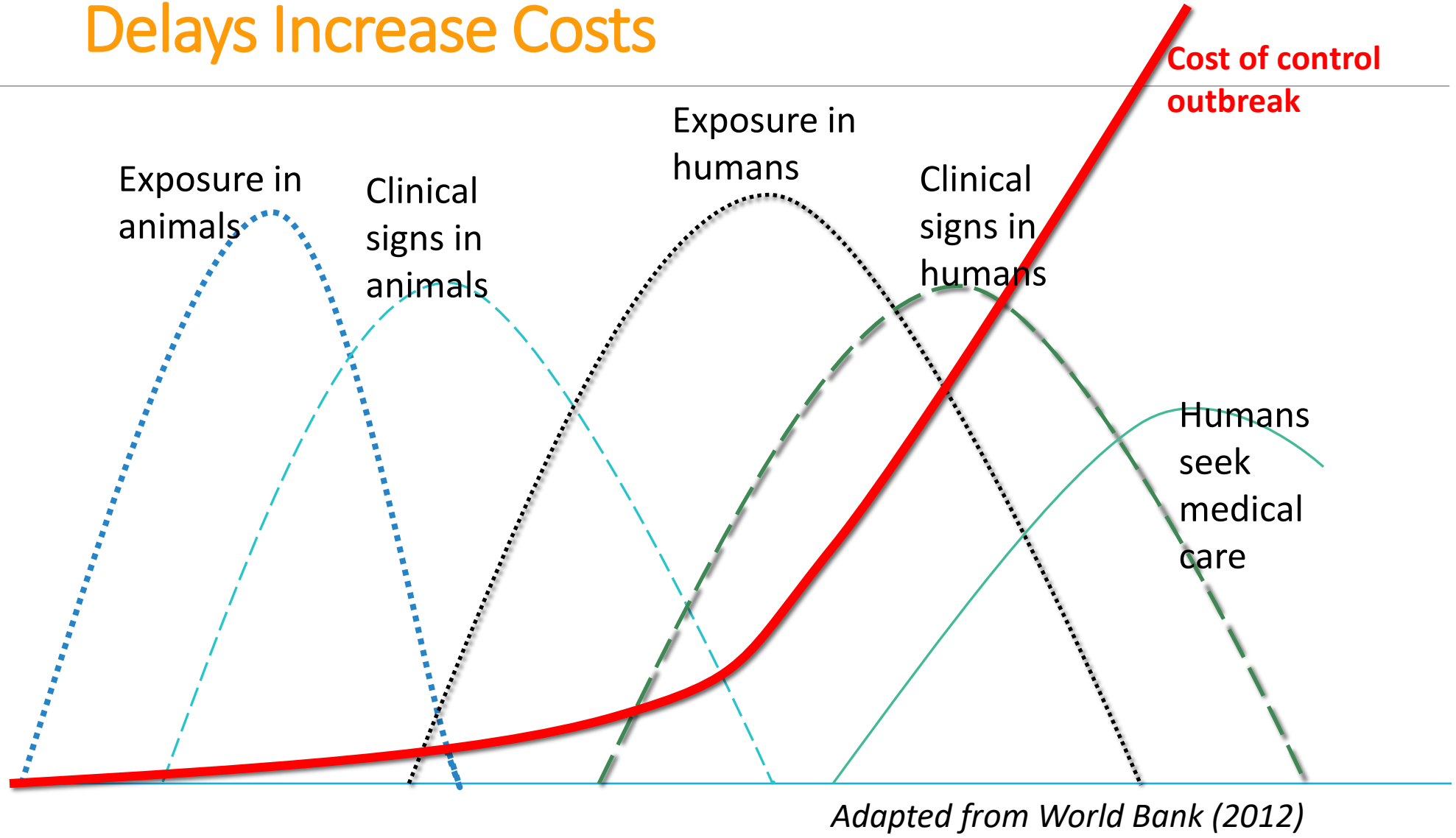
2.5 billion cases of illness

2.7 million deaths

Rabies causes

- ~ 59,000 deaths
- $8.6 billion in economic loss

Delays Increase Costs



Adapted from World Bank (2012)

Biosecurity Principles

SEGREGATION

Create barriers to prevent infected animals and contaminated materials from entering the farm.

CLEANING

Everything that enters the farm must be cleaned of all visible dirt and manure.

DISINFECTION

Disinfect all vehicles, equipment and supplies entering and exiting the farm to destroy infectious agents.

Disease Exposure Pathways

- Direct contact
  - Infected waterfowl in contact with poultry
  - Introduction of infected animal into a flock
  - Sick animals in flock infecting other animals
- Aerosol
  - Inhalation of virus particles through the air
  - Less of a concern for HPAI

Disease Exposure Pathways

- Oral
  - Animal eating, licking, chewing or biting
  - Infected feed, water, equipment, fencing, etc.
- Fomites
  - Inanimate objects that can spread disease
  - Shovels, bowls, buckets, tools, etc.
  - Shared equipment

Disease Exposure Pathways

- Vectors
  - Living organisms that can spread disease
  - Arthropods, insects, feral animals, rodents and scavengers

Effective Carcass Management Can Prevent Spread Disease:

Wild boar carcass collected to prevent the spread of ASF

Dead pigs are strewn along the riverbanks of Songjiang river in Shanghai, China (2013)

Improper Carcass Management Can Have Significant Environmental Impacts

November 13, 2019

Korean river runs red from blood of pigs culled amid African swine fever outbreak

As South Korea battles an outbreak of African swine fever (ASF), the destruction of some 47,000 pigs has led to the Imjin River, which runs through the demilitarised zone, turning blood red.

The strange colour is the result of the river being polluted with the blood of many of the slaughtered pigs. Heavy rains caused their blood to flow from a border burial site into a tributary of the Imjin.

South Korean authorities culled the pigs in an attempt to halt the spread of the disease, which is highly contagious and incurable, with a near zero survival rate for infected pigs.

Decontamination Starts with Cleaning

Disinfectants do not work through soil or manure

Proper Disinfection

- Disinfectant demonstrated effective for the disease of concern
- Concentration
- Contact Time

Restocking without Effective Decontamination Leads to Reinfection

- ✓ Manpower resources wasted
- ✓ Additional animals destroyed and income lost
- ✓ Export/Zoning implications

Environmental Implications of Carcass Disposal

Volume of Carcass Leachate

- Piglets 80% water
- Adult pigs 55% water
- Broiler 70%
- Example:
  - 160 kg pig
  - 88 kg of water
  - 88 liters of leachate

Composition of Carcass Leachate

- Chemical Constituents
  - 12,600 mg/L of ammonium-N
  - 46,000 mg/L alkalinity (as bicarbonate)
  - 2,600 mg/L chloride
  - 3,600 mg/L sulphate
  - 2,300 mg/L potassium
  - 1,800 mg/L sodium
  - 1,500 mg/L phosphorus
  - 2,000 mg/L nitrate

Why is nitrogen a problem?

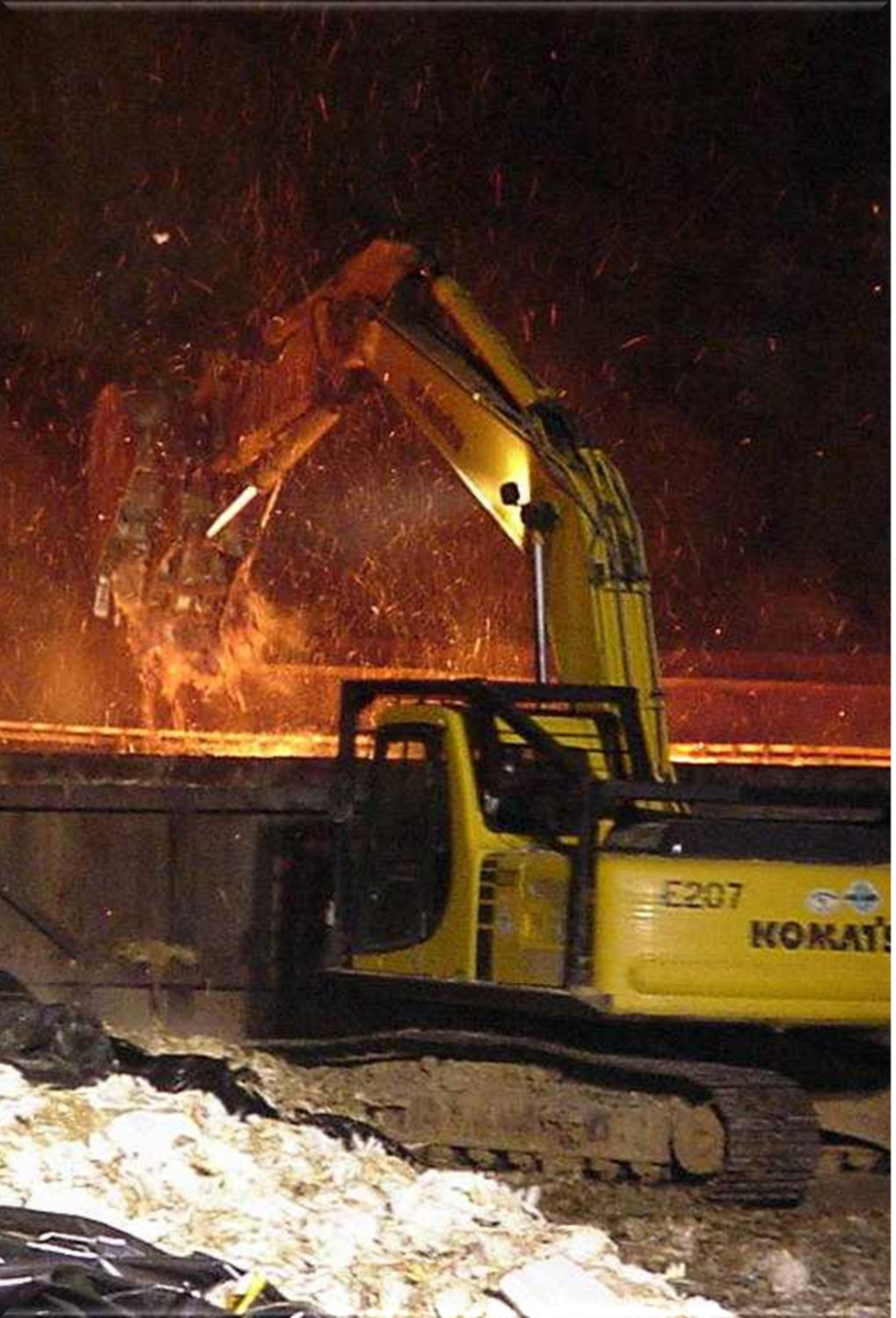
- Drinking water standard for nitrates is 10.0 mg/L
- Carcass burial sites generate over 1000 times the standard
- High levels of nitrates in drinking water may cause Methemoglobinemia (blue baby syndrome) which can be fatal to infants
- Excess nitrogen is toxic to aquatic life
- Excess nitrogen stimulates aquatic plant growth (eutrophication)
- Excess nitrogen depletes dissolved oxygen in receiving waters

Composition of Carcass Leachate

- Microbes/viruses
  - E. coli
  - Salmonella
  - Campylobacter
  - Influenza viruses
  - Prion and spore formers
- Veterinary Pharmaceuticals
  - Hormones
  - Antimicrobials

Gasses Released from Carcass Decomposition

- Carbon dioxide
- Carbon monoxide
- Nitrogen Oxide
- Sulfur dioxide
- Hydrogen chloride
- Fluoride
- Methane



Composition of Carcasses During Burning

PARTICULATE MATTER

DIOXINS

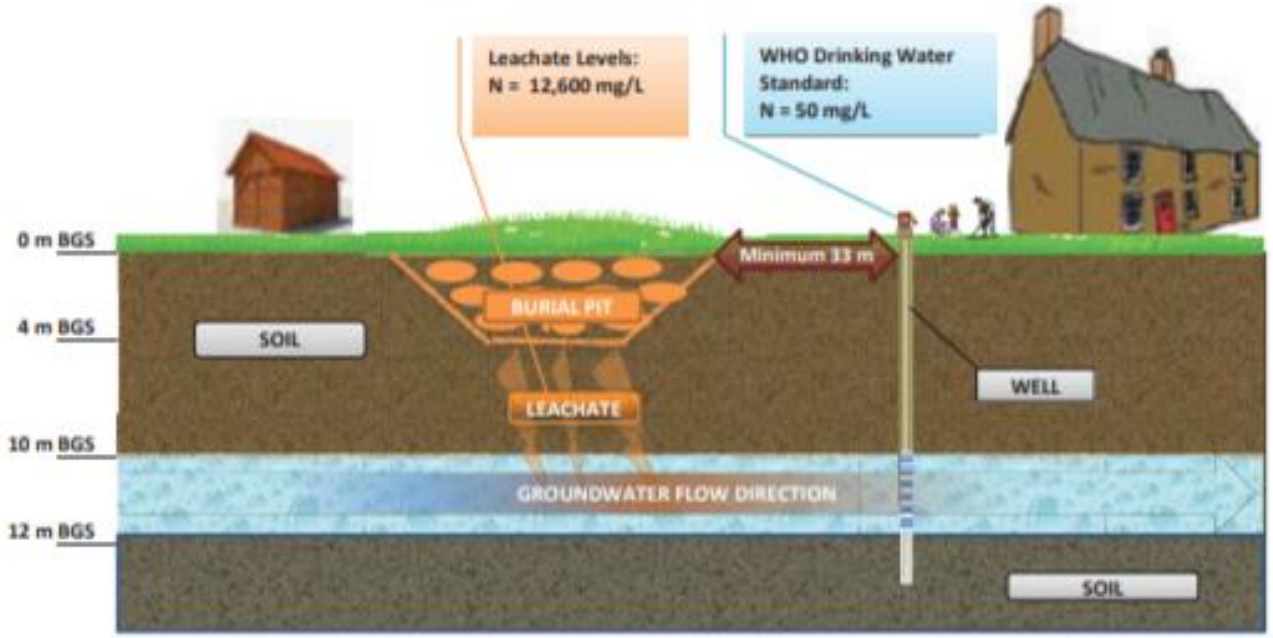
POLYAROMATIC HYDROCARBONS

METALS

Carcass Disposal Methods

Carcass Disposal Methods

- Deep Burial
- Open Burning
- Shallow Burial with Carbon
- Composting



BGS - below ground surface; m - meter(s); mg/L - milligrams per liter; N - Nitrogen; WHO - World Health Organization

Source: Lori Miller, USDA, 2018

Deep Burial

DEEP BURIAL ADVANTAGES AND DISADVANTAGES

Advantages	Disadvantages	Time/Cost	Considerations
• On-farm • Easy to implement	• Public health risk • Biosecurity risk • Pathogens may survive • Not sustainable • Regulatory limitations • Limits future land use • Requires heavy equipment or excessive labour	Fast Low cost	• Burial may be viable for small numbers of animals in suitable soils, but it is site-specific

Deep Burial-Advantages and Disadvantages

Deep Burial-Operational Considerations

- Soil type and depth
- Depth to groundwater
- Community impacts
- Environmental Impacts
- Fate of disease organism

Open Burning

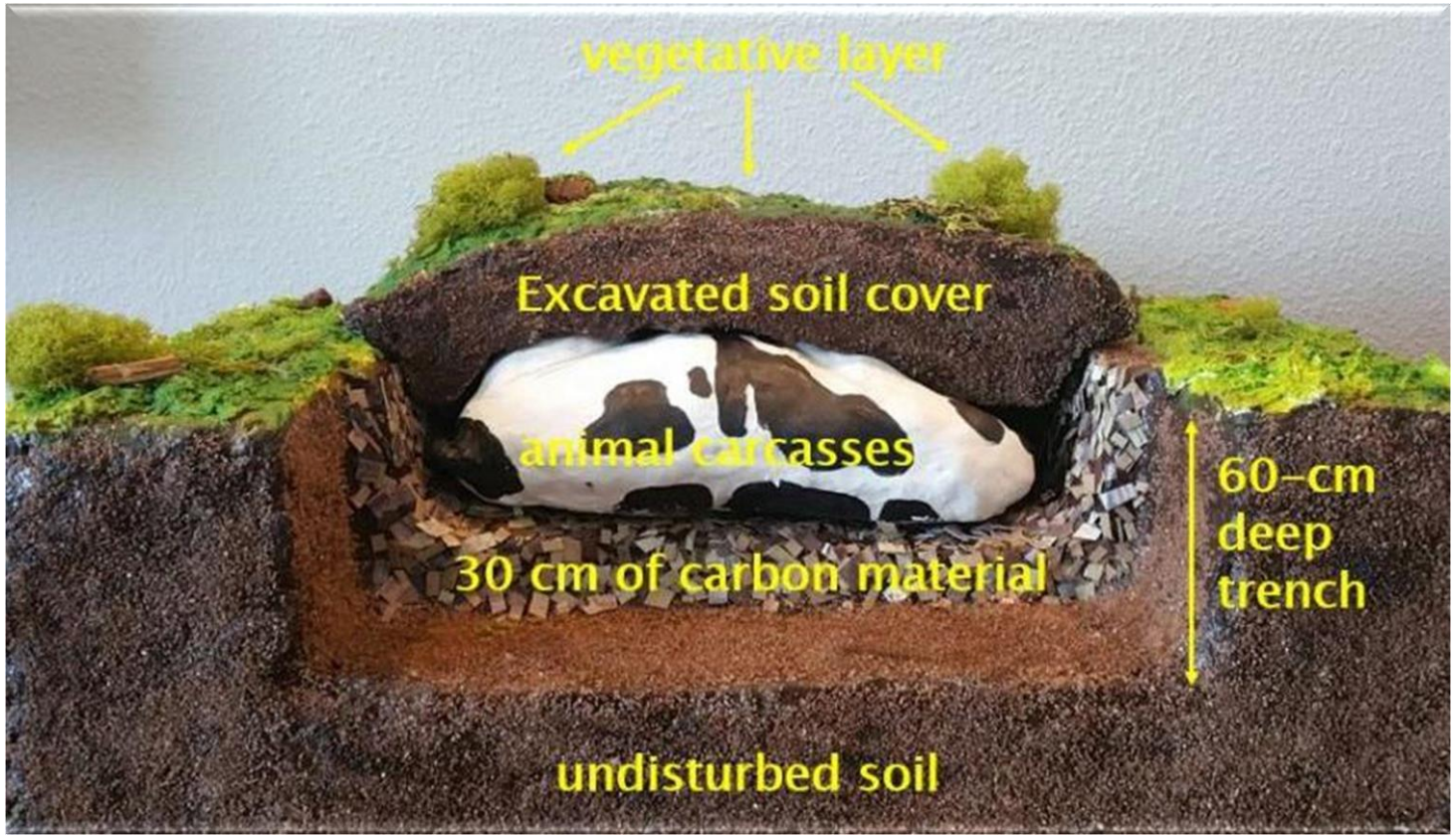
OPEN BURNING ADVANTAGES AND DISADVANTAGES

Advantages	Disadvantages	Time/Cost	Considerations
• On-farm • Inactivates pathogens • Reduces volume	• Biosecurity risk • Not sustainable • Public opposition • Inefficient • Difficult to operate • Regulatory limitations	Slow Expensive	• Open burning poses risk of creating wildfires • Air quality • Smell

Open Burning-Advantages and Disadvantages

Open Burning- Operational Consideration

- ❑Availability of fuel
- ❑Disease transmission
- ❑Environmental impacts
- ❑Neighbor complaints
- ❑Equipment availability



Shallow Burial with Carbon

ABOVE-GROUND BURIAL ADVANTAGES AND DISADVANTAGES

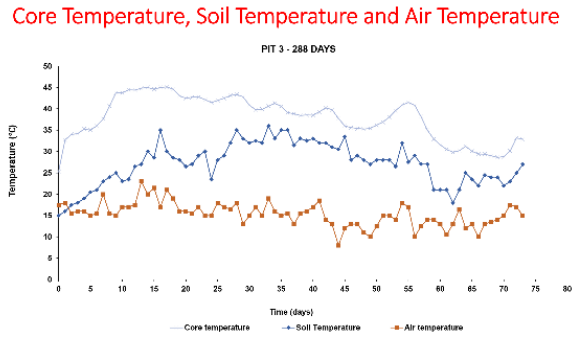
Advantages	Disadvantages	Time/Cost	Considerations
• Safe • On-farm • Readily available • Fast to implement • Public acceptance • Efficient	• Scavengers may unearth carcasses	Fast Low cost	• Innovative technology undergoing field trials and validation testing

Shallow Burial with Carbon-Advantages and Disadvantages

Shallow Burial with Carbon- Operational Considerations

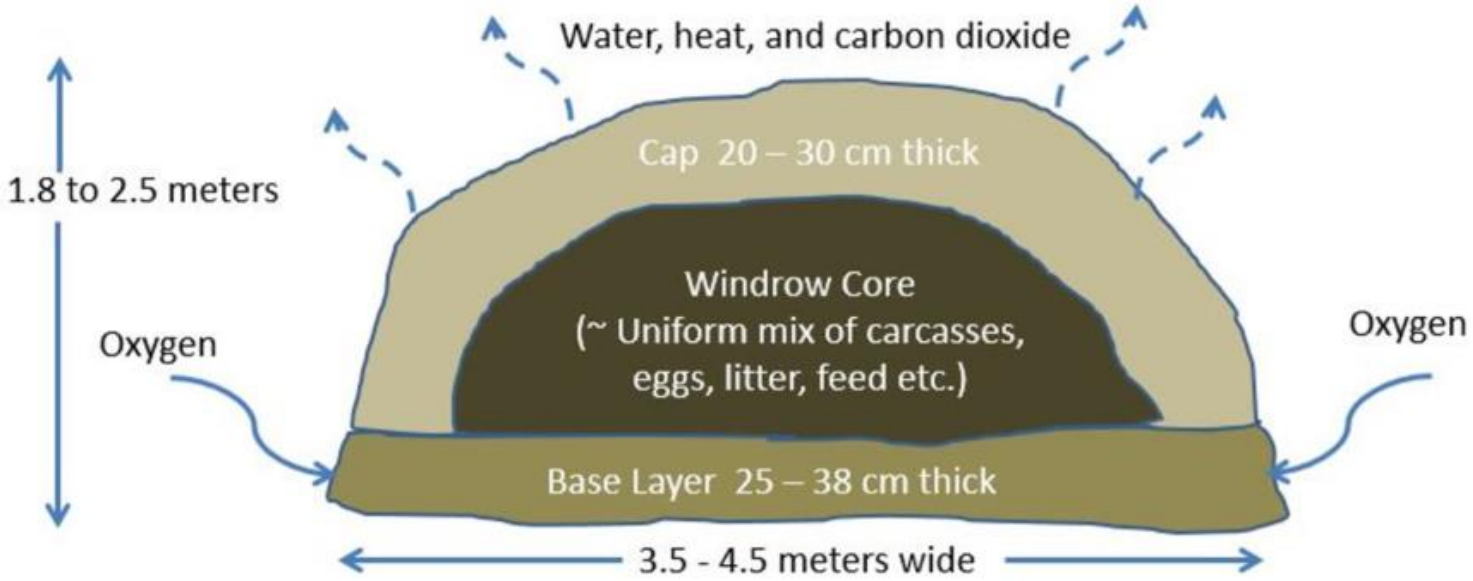
- Availability of carbon material
- Depth to groundwater
- Access control
- Divert stormwater away from disposal site

Viability of ASFv in SBC



Research in Vietnam with ASF infected swine

- Collected samples at 0,1, 3, 5, 7, 14, 21, 28, 35, 56, 144, and 288 days
- Sampled spleen and bone marrow
- Analysis using RT-PCR and virus isolation through cell culture
- DNA detected in all samples from day 0-35 except for 3 samples at day 35
- Virus was not recovered in all samples from day 5-35
- Bioassay work showed complete inactivation



Cross Section of Compost Windrow

Composting

COMPOSTING ADVANTAGES AND DISADVANTAGES

Advantages	Disadvantages	Time/Cost	Considerations
• Safe • Sustainable • On-farm • Easy to implement	• Time to complete	Slow Expensive	• Requires knowledgable/ experienced operator to ensure proper construction

Composting-Advantages and Disadvantages

Composting- Operational Considerations

- Availability of carbon material
- Time
- Need for an experienced operator
- Access control

QUESTIONS?

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