General Concepts in Semen Station Biosecurity

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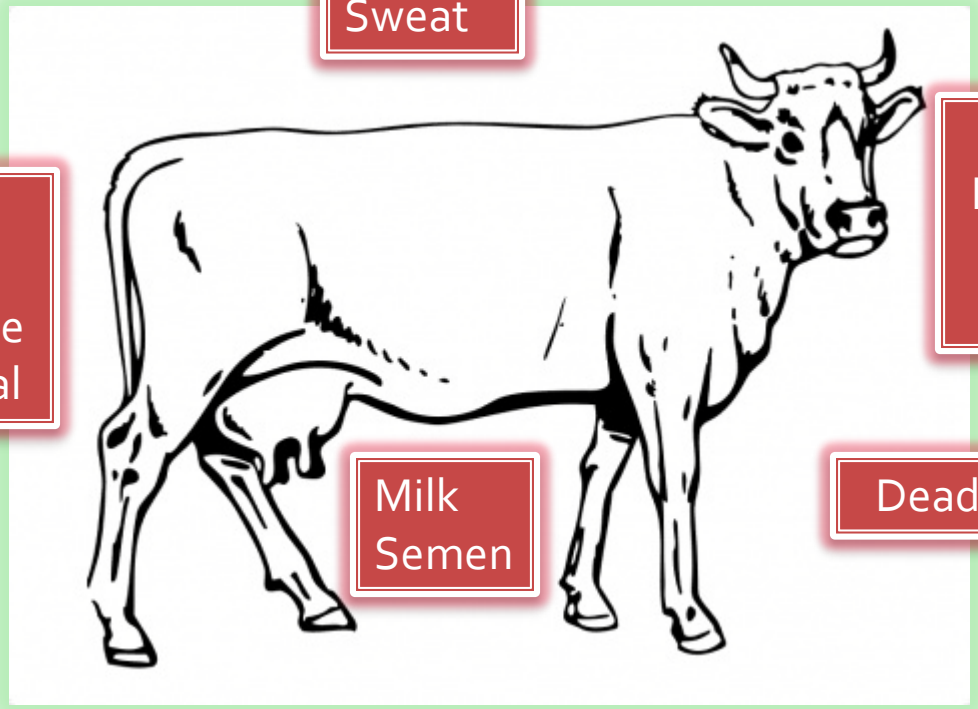
Animal health challenges

- Many diseases are endemic in India - maintaining a disease free herd very challenging
- Culling of cattle – not practical
- TB, IBR, BVD, Paratuberculosis – no vaccine available
- Biosecurity requirements of a facility is dependent on the risks

Release of pathogen from infected animal



Sweat

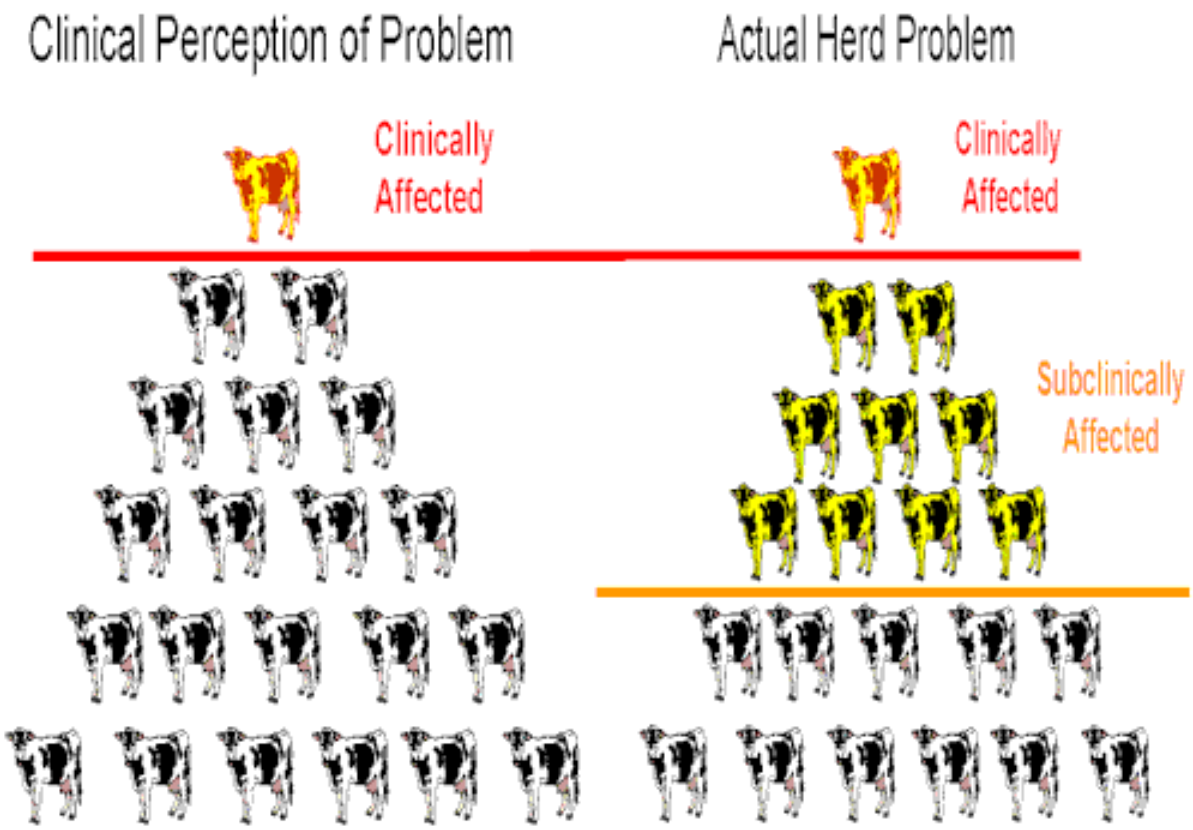
Feces
Urine
Genital discharge
Aborted material

Tears
Nasal discharge
Exhaled air
Saliva

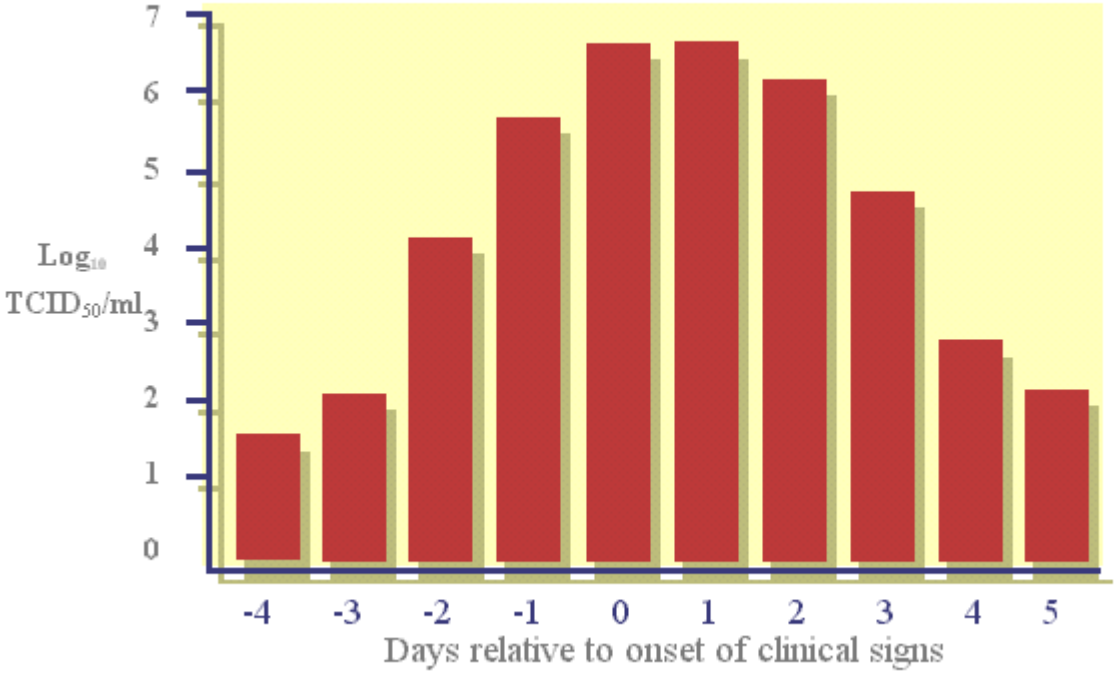
Milk
Semen

Dead animal

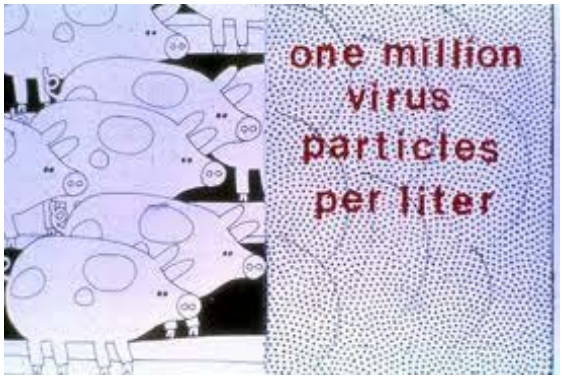
Hidden infection

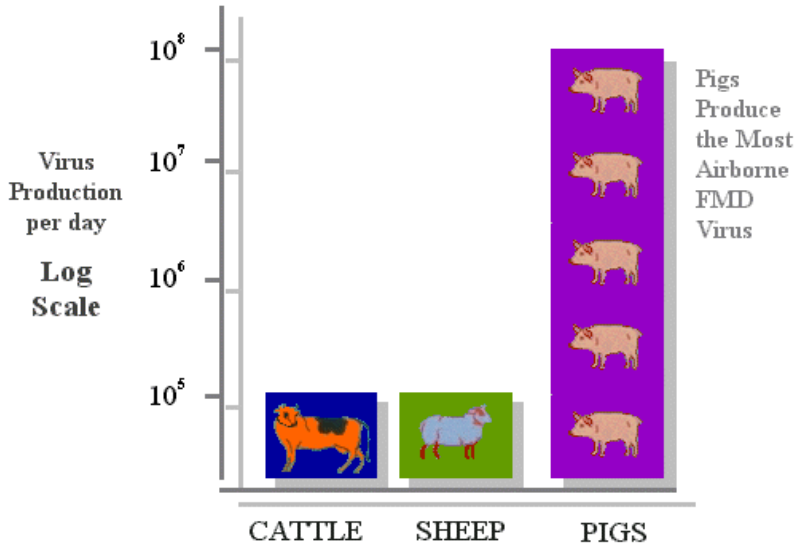


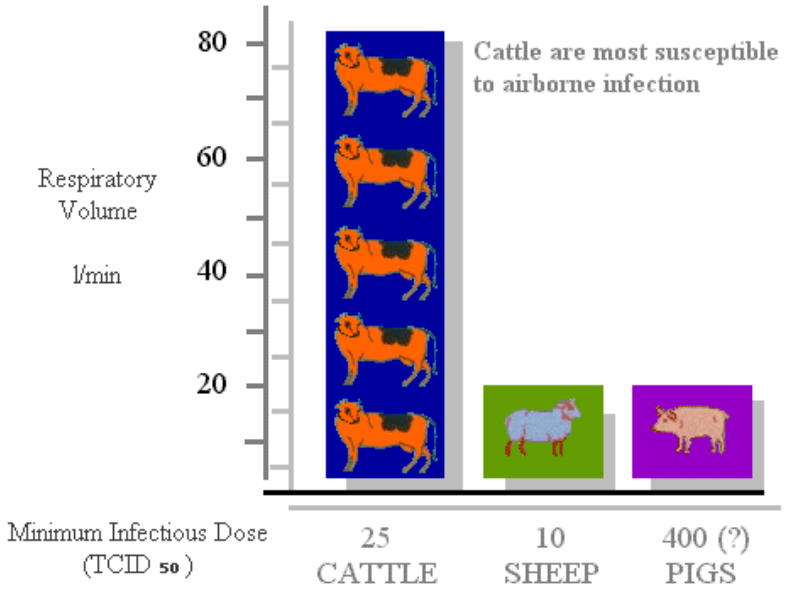
Excretion before clinical signs



Aerosol


one million
virus
particles
per liter

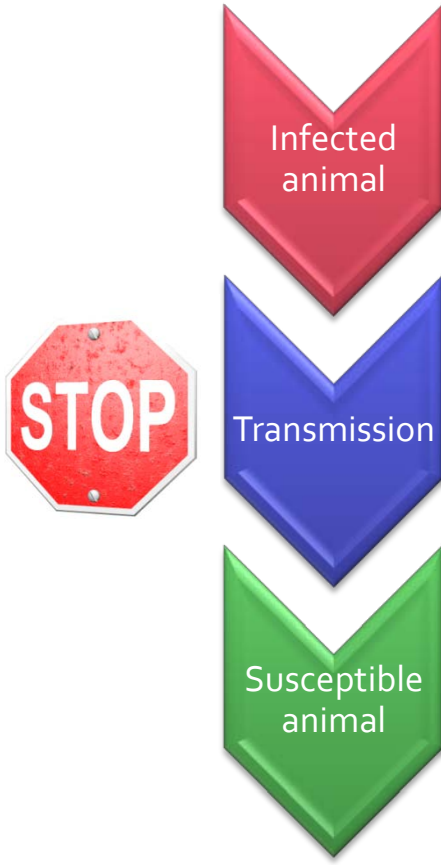

Virus
Production
per day
Log
Scale
10^8
10^7
10^6
10^5
Pigs
Produce
the Most
Airborne
FMD
Virus
CATTLE
SHEEP
PIGS


Respiratory
Volume
l/min
80
60
40
20
Cattle are most susceptible
to airborne infection
Minimum Infectious Dose
(TCID 50)
25
CATTLE
10
SHEEP
400 (?)
PIGS

Limitations of laboratory diagnosis

- Sensitivity & specificity of tests
- Variations in the test
  - Operator
  - Batch of reagents
  - Storage & shipment of sample & reagents

Stop disease spread



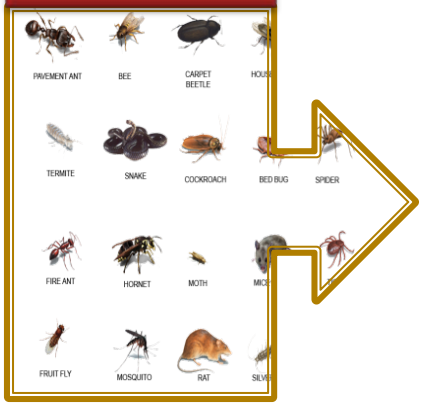
How to proceed

- Undertake Risk Analysis
- Develop biosecurity protocols (SOPs)
- Implement SOPs
  - Identify Biosecurity Officer
  - Arrange training and workshops
- Maintain records and documentation
- Assess disease specific status – Free, Controlled or Infected

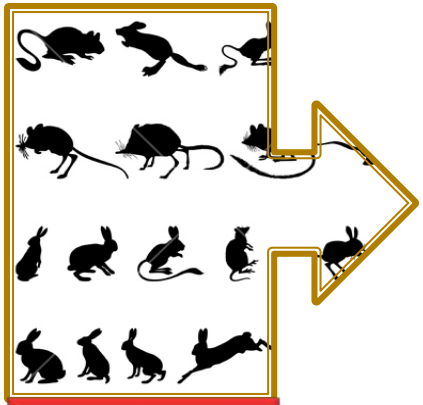
Wild animals

New animals

Pests



Visitors



Rodents

Vehicle

Fodder

Water

Risk - Location

- Near slaughter house
- Near cattle market
- Near migratory cattle route
- Near forest – wildlife area
- In water-logging prone area
- Community water resource -lake, pond, canal etc.
- Public road in the establishment
- Community pasture

Migration & market

Risk-Infrastructure

- Untrained or inadequate manpower
- Same personnel, farm machinery and material for bull, quarantine animals and sick animals
- Poor effluent drainage system
- Inadequate change rooms and protective clothing
- Incomplete or no boundary wall or fencing

Typical establishment

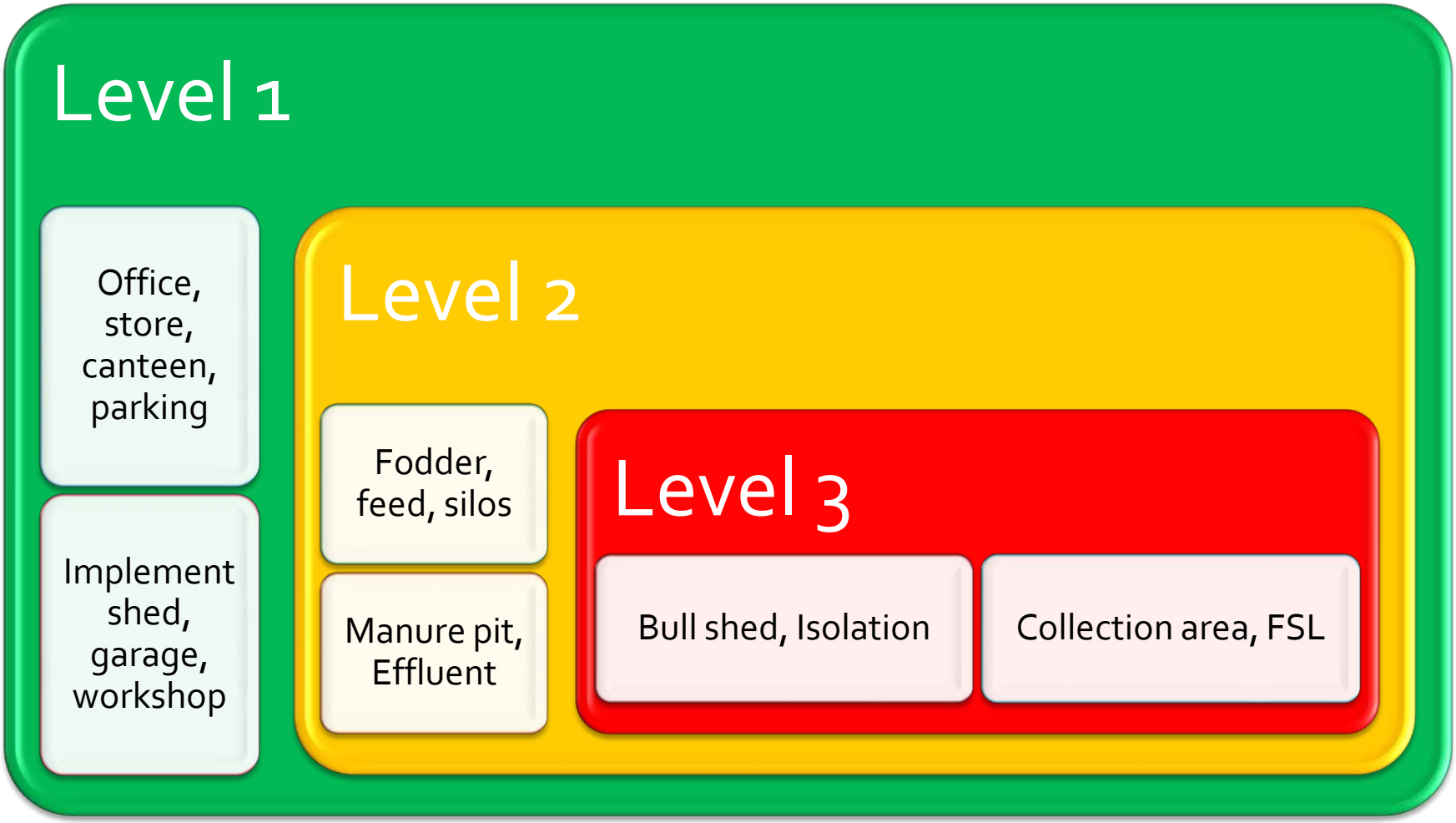
- Bull sheds, loafing area
- Collection arena, FS Laboratory, FS storage
- LN plant, LN storage
- Rearing centre
- ONBS
- ET centre
- Quarantine
- Isolation shed
- Office, store, canteen
- Fodder farm, farm implements, workshop
- Feed, hay, silage storage
- Water tank, DG set, sub-station
- Training centre
- Guest house
- Product sale centre
- Resident quarters

Keep only essential sections to reduce the risk.

Risk - Design

- No quarantine or quarantine close to animal accommodation or not for individual animal
- No isolation unit for sick animals or close to animal accommodation or not for individual animal
- Common feeding and watering facility
- Open effluent passing through animal housing
- No boundary wall / fencing

Risk levels in SS



Risk - Policy

- Culling of positive animal
- Disposal of carcass, animal tissues and other organic matter
- Workers
- Visitors
- External disease testing
- Keeping only male cattle and buffalo
- Keeping only the functions related to semen production

Workers

- Change of protective clothing for level 2 and 3
- Hand and foot bath
- Personal hygiene
- Not keeping animals at home
- Screening against TB and Brucellosis

Visitor

Visitors

- Not encouraged
- Only after proper authority
- Change to protective clothing for level 2 and 3 risk areas
- Visitor parking and meeting rooms outermost
- Proper signage

Vehicle

- Outside vehicle only up to the boundary
- Proper tyre dip and cleaning to remove dirt
- Animal transport vehicle – disinfection before and after

Disposal

Careful about exit of

- Workers
- Visitors
- Dead animals, aborted fetus, placenta etc.
- Dung, manure etc.
- Effluent
- Left over feed
- Used medicines, syringes etc.
- Animal produce

Surveillance

- Surveillance in a zone 10 km around the semen station
- Monitor
  - Onset of diseases
  - Vaccination
  - Sero-monitoring & sero-surveillance
  - Farmer education for prompt disease reporting

Summary

- Biosecurity is more about 'Practices' than 'Building'.
- Zero risk is not possible.
- Minimum requirements
  - Biosecurity officer & Biosecurity manual
  - Surveillance in neighborhood
  - Emergency preparedness – SOPs
  - Training and education
  - Periodic risk assessment

Thank you