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VIRTUAL COURSE

26 March to 15 April 2021

Design of an Active Surveillance for Tilapia Lake Virus (TILV) Disease and Its Implementation

TCP/INT/3707: Strengthening biosecurity (policy and farm level) governance to deal with Tilapia lake virus



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CHECKLIST 2

30 March 2021

Defining surveillance objectives

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TCP/INT/3707: Strengthening biosecurity (policy and farm level) governance to deal with Tilapia lake virus



Learning objectives

- To understand the requirements and criteria for Checklist 2
- To define TiLV surveillance objective based on health status scenario



Presentation topics

- Purpose of surveillance
- Objectives of surveillance
- Type of surveillance (approaches)
- Epidemiological unit
- Epidemiological compartment and zooning

Homework

Define objectives of TiLV surveillance based on scenario determined in Checklist No 1 and accounting for:

- disease or threats
- occurrence of diseases
- level of certification
- timeframe



What is the overall purpose of surveillance?

- To inform stakeholders and assist in decision-making on the planning and implementation of control measures
 - Trade
 - Support safe movement at farm, zone or national level
 - Eradication/mitigation of disease
 - Prioritization of resources
 - Socio-economic impact
 -
- Should be cost-efficient!



Epidemiological approach

- To define clearly the problem and the scope, context and expected outcomes of the investigation
- This must include determination if there is a disease problem and, if there is, to:
 - Determine the extent and impact of the problem
 - Identify possible and probable cause (s) and source (s) of the problem
 - Identify likely risk factors for the disease, and
 - Make recommendation for control and/or treatment and the future preventive actions.



Evolution of surveillance

- From input to output based
- Should be tailored designed
 - wide variety of species cultured, the pathogens and management systems
- Support to domestic production
- Tool to promote international trade (international disease reporting, OIE standards)
- Moving toward **Output based approaches**



Objective of AAD surveillance

- **Objective of AAD surveillance**
 - Dependent from disease presence/absence
 - Dependent from certification level (farm/region/country)
- **Disease present**
 - Reliably measure disease frequency/trends
 - Make corrective actions
 - Monitor effectiveness of DCP
- **Disease absent**
 - Demonstrate disease freedom
 - Early detection of disease
- **Outbreak investigation**



Objective of AAD surveillance

- Different certification level
 - **Farm accreditation/certification**
 - **National/regional disease free status**
- Monitoring of diseases in environment
- May target specific disease
- May include multiple diseases (even previously unknown/unseen)



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Various surveillance approaches

- **Passive surveillance**
- **Active surveillance** (Targeted surveillance)
- **Risk-based surveillance**
- Sentinel surveillance
- Syndromic surveillance
- Market surveillance
- Post-harvest processing
- ...and more



Passive surveillance

- Not targeted for a specific disease
 - Notifications by farmers
 - Routine diagnostic samples
- Will mainly detect disease (rather than infection only)
 - Non-requested agent investigation based on history and other laboratory findings
- Usually underestimates the prevalence of disease
- Recommended by the OIE as a first step in the surveillance effort



Active surveillance

- Specifically designed sampling of a defined population
- Can achieve a “reasonably high” confidence level
- Can be designed to identify infection or disease
- Usually very resource intensive
 - People
 - Laboratory
 - Money



Risk-based surveillance

- Most commonly recommended surveillance design (e.g. the EU)
- Aims to increase the cost-efficiency
 - Disease probability
 - Severity of consequences of disease
- Several areas of inclusion, e.g.
 - Populations
 - Sample size calculation
 - Data analyses
 - Data interpretation



Disease reporting and notification (OIE)

- Immediate notification (within 24 hours)
 - First occurrence or re-occurrence of OIE listed diseases
 - First occurrence in new host species
 - New disease manifestation or new pathogen strain
 - With newly recognized zoonotic potential
 - Non listed diseases if could have epidemiological significance
- Weekly reports (after immediate notification)
- Six monthly report
- Annual questionnaire



Epidemiological unit

- Group of animals that share approximately the same risk of exposure to disease agent with defined location.
- This may be because they share a common aquatic environment, for example, fish in a pond, caged fish in a lake, or because management practices make it likely that a disease agent in one group of animals would quickly spread to other animals, for example, all the ponds on a farm, all the ponds in a village system



Zoning/compartmentalization

- ‘zoning’ and ‘regionalization’ have the same meaning – ‘zoning’ is now used in the Codes
- zoning and compartmentalization are procedures implemented by a country
 - to define sub-populations of different animal health status within its territory
 - in accordance with the recommendations in the OIE Codes
 - for the purpose of international trade



Zoning/compartmentalization

- zoning/compartmentalization allows a concentration of resources where there is greatest chance of success
 - in controlling or eradicating a disease
 - gaining or maintaining market access for certain commodities
- where freedom of the whole country from the disease is not possible or practicable
- zoning applies to an animal sub-population defined on a geographical basis
- compartmentalization applies to an animal sub-population defined by management practices relating to biosecurity



OIE definitions

- Zone/Region
 - a clearly defined part of a country ...
- Compartment
 - one or more establishments (premises in which animals are kept) under a clearly defined **common biosecurity management system**
- containing an animal sub-population with a distinct health status with respect to a specific disease or diseases
- for which required surveillance, control and biosecurity measures have been applied for the purpose of international trade



OIE definitions

- GA of OIE adopted the concept of compartmentalization at the 72nd general session (2004)
- Concept is based (as related zoning) on the definition and management of an animal subpopulation of specified (disease free) health status.



Basic concept: zone

- A zone means a portion of one or more countries comprising:
 - An entire water catchment area
 - More than one water catchment
 - Part of water catchment
 - Part of coastal area
 - An estuary with precise geographical determination



Compartment in aquatic

- Strong biosecurity practice
- Prohibitions of external fish introduction
- Conducting routine surveillance (both observational and active)
- Utilize accredited laboratory
- Engage Competent Authority oversight of fish health and biosecurity

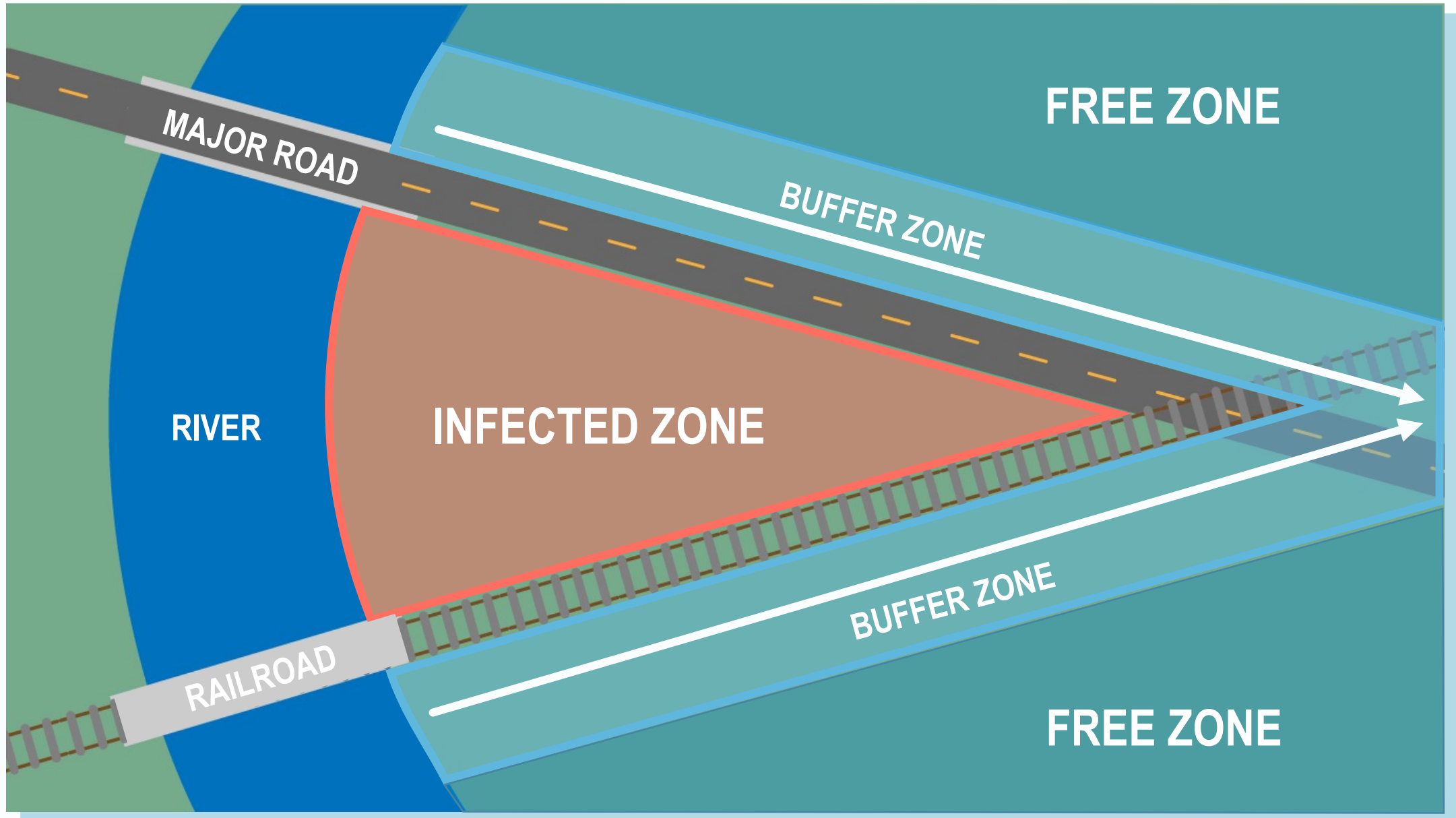


Application of the concepts

- the extent of a zone is established on the basis of natural, artificial or legal boundaries
- the requirements for a compartment are established on the basis of management practices relating to biosecurity (by the Veterinary Administration/CA)
- It is recommended to develop a compartment in a disease free country (peace time) and activate it when a disease outbreak occurs, allowing for continuity of international trade.
- The compartment should be developed by a private company (OIE CODE) and should be approved and supervised by CA

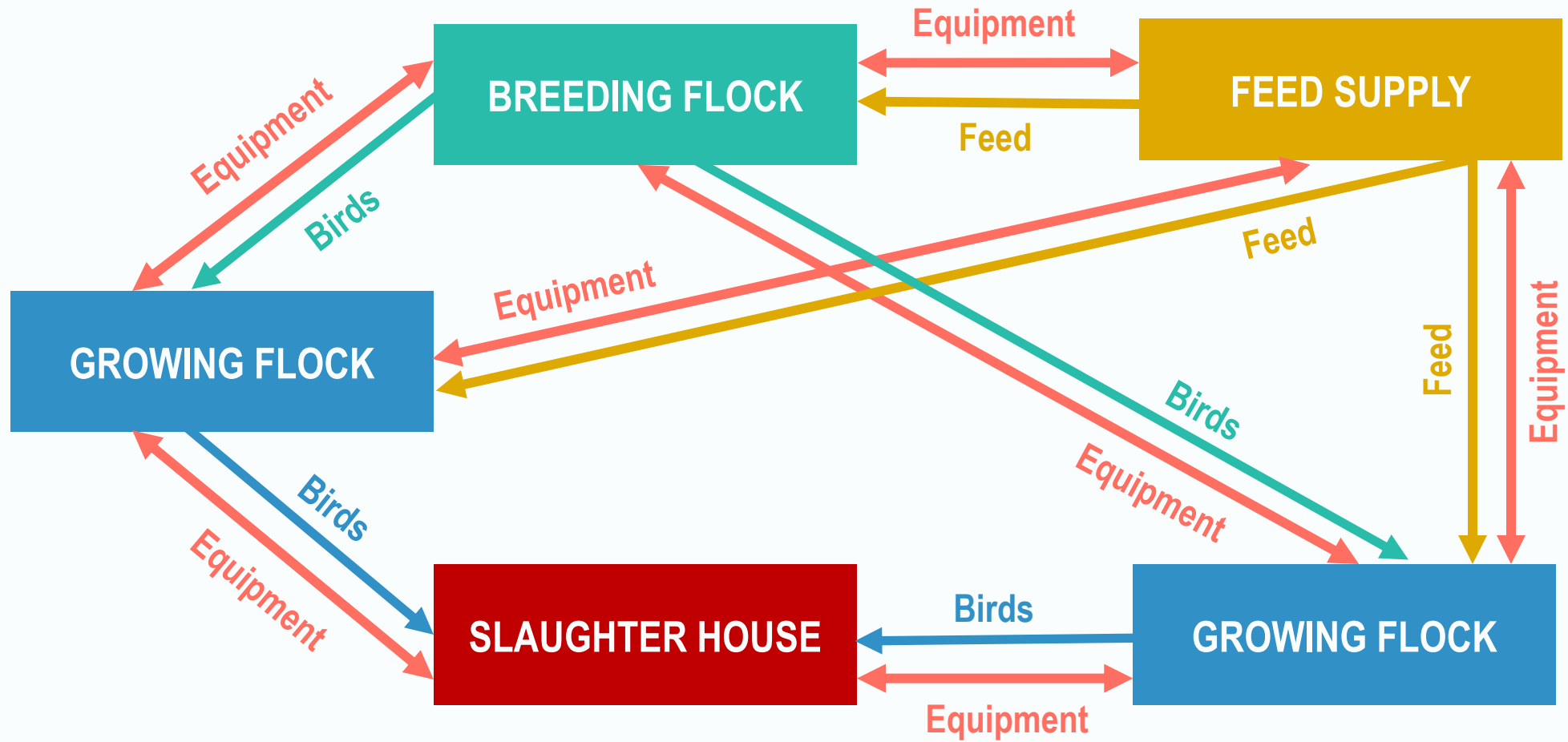


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Compartment





Recommendations

- Zoning or compartmentalization not mandatory
- Code recommendations exist or will be developed for zones and compartments for diseases for which the concepts are appropriate
 - for some diseases, either concept may not be appropriate



Application depends on

- epidemiology of the disease
- environmental factors
- necessary surveillance
- appropriate and applicable biosecurity measures
- quality of vet services / other competent authority
- cooperation between govt and private sector for compartments



Application of the concepts

- CA must document the measures taken to
 - identify the animal sub-population
 - recognize its distinct health status
 - maintain its distinct health status
- dossier will be as detailed as situation requires
- compartmentalization requires good cooperation and trust between private sector and government
 - developed by private sector
 - initial determination and regular audits by govt
 - official international negotiations by govt
 - credibility



Factors to consider in application

- epidemiology
 - how does the disease spread ?
 - what species does it affect ?
- environment
 - temperature / humidity
 - natural / artificial barriers
- biosecurity measures
 - dedicated staff and equipment
 - animals housed vs free range
 - imposed movement controls



Application of the concepts

- exporting country wanting to define a zone or compartment within its territory needs to implement the Code recommendations for setting up and maintaining such a zone or compartment
 - or equivalent measures
- within the context of
 - competent vet services
 - sound knowledge of the animal population
 - ability to survey for and diagnose disease accurately
- an importing country should recognize this zone or compartment, subject to the application of the appropriate Code recommendations
 - with regard to the importation, or transit through its territory, of commodities from that zone or compartment



Uses

- in disease control/eradication campaign
 - progressive zoning/compartmentalization allows stepwise approach
 - allows concentration of resources where greatest chance of success
- in trade zone
 - to gain / maintain market access for certain commodities
 - where whole country freedom not possible or practicable



Where to apply

- A group of coastal farms under a common of biosecurity management system, considering as one epidemiological unit
- A individual continental farm that is considered as one epidemiological unit
- More than one farm provided that each farm complies with previous



Biosecurity plan

A plan that identifies significant potential pathways for the introduction and spread of disease in zone or compartment, and describes the measures which are being, or will be, applied to mitigate the risk to introduce and spread disease, taking into consideration the recommendation in the Aquatic code.



How to establish compartment?

- CA set the rules for operation of compartments and prepare the arguments needed to convince trading partner that a given establishment meets the standard for a compartment based on Aquatic code.
- Subpopulation of animals and derived commodities must be defined as well as diseases that will be included in compartment



Steps in the response to an outbreak

	PRE-OUTBREAK		OUTBREAK				POST-OUTBREAK				
Early detection			Red								
Investigation			Blue	Blue	Blue	Blue					
Biosecurity			Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Surveillance			Red	Red	Red	Red	Red	Red	Red	Red	
Stamping out and disinfention					Red	Red					
Repopulation							Red				
Demonstration of free status							Red	Red			



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TCP/INT/3707:

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