



Lumpy Skin Disease (LSD) risk factor in Neverland

Country name : **Malaysia**

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How to investigate the outbreak ?

Provide a detailed stepwise approach on how to investigate an outbreak

- Identify which province/district/household that is affected
→ disease reporting from possible sources
(e.g. locals, farmers, veterinary authority, rumors – animal collapsing, severe wounds/flystrike)
- Identify type of farms/premises that are affected
– confirmed laboratory positive or clinically positive animals?
- Prepare questionnaire to gather information on farm/household affected
– to include possible contributing risk factors (require brainstorming)
- Observe affected herd/animal and take appropriate samples
– sero (post clinical), lesions (new cases), vector (if present)
- Observe for
→ surrounding nearby farms/herd/roaming animals (close contact)
→ environmental factors (e.g. water bodies)

Case definition and define controls

Develop a case definition, and then define suitable controls and where to find them

- **Epidemiological unit : Household**
- Case definition : Household with confirmed LSD case farm exposed to risk factors from Jan - August 2021
- Control : Household with negative LSD farm exposed to risk factors within the same province from Jan - August 2021
- * List of all farms in the affected province
- * List of positive LSD farm in the province (reported LSD case)
- * List of negative LSD farm in the province (no reported LSD case)

Stakeholder involved

Who provides information, who are local people to be involved

- Affected household (farmers)
- Cattle traders
- Slaughterhouse / Butchers
- DIY AI Inseminators
- Rice farmers (rice farming practices)
- Regional Veterinary authority (disease occurrence, livestock census)

Source and transmission

How do you generate information about infection sources and factors contributing to transmission within and between villages ?

- Design a questionnaire to gather information about infection source:
 - * important question to ask
 1. Information on disease occurrence (morbidity/mortality, onset of disease, outbreak period & timeframe etc)
 2. Species of animals reared together. Multispecies?
 3. Any new animal introduction? Traceability- permit/animal health certificate? Any animal being moved into the farm? Other possible incursion factors
 4. Breeding practices. Natural/ AI, any bull sharing ?
 5. Any farm equipment sharing?
 6. Any common grazing area? What grazing method practiced? Any rotation of grazing areas?
 7. How is the farm management? Worker/biosecurity?
 8. Vector elements: Any biting insects observed in farm?
 9. LSD Clinical sign chart for disease observation survey
 10. Any vaccination practiced?
 11. Any consultation with a veterinarian / veterinary authority?
- Animal movement information – permits, certificates (trend changes from Jan– Aug 2021)
- Observation of surrounding environment – water bodies, road networks, surrounding nearby households/farms, grazing grounds, jungle, roaming animals (including buffaloes), climate/weather changes, other factors contributing to vector propagation

Evaluation

Evaluate the consequences of LSD infection of animals, such as production loss associated with mortality and morbidity

Need to gather information on: questionnaire/ records collection

1. PE of animals – physical condition of animal (Dull? Recumbent? Limping?)
2. Reduction in animal body weight / body scoring (BCS)?
3. Percentage of LSD morbidity in farms
4. Percentage of LSD mortality in farms
5. Any reduction of milk production (per day/animal)
6. Breeding performance – any infertility observed among breeding animals? Any abortion occurred?
7. Hide production quality – any effect?
8. Post clinical disease - secondary opportunistic infection by other pathogens

Study size

****Prevalence – referring to OIE's Technical Disease Card on LSD for morbidity**

Please enter the ratio of controls to cases	3
Please enter the prevalence of the risk factor	** 20.0 %
Please enter the values for two of the following parameters, and ? for the parameter to be calculated	
Sample size (both groups combined)	56
Power	95.0 %
Relative risk to be detected	2.00
Please give two values and one ?	
Type I error	5.0 %
Sides	2
To change these values return to Start	

Results			
	Total	Group 1	Group 2
Sample size	56	42	14
Power	95.0 %		
Minimum detectable relative risk >1	2.00	Maximum detectable relative risk <1	
			Return to start

Summary /discussion

- If $OR > 1$ for association between an exposure/risk factor and disease
→ higher risk for LSD due to that particular exposure/risk factor
- If $OR < 1$ for association between an exposure/risk factor and disease
→ higher protection vs LSD due to that particular exposure/risk factor
- Possible misclassification bias, during recall for control group (possible LSD case but not reported)
- Potential selection bias – cases may come from smaller herds, controls may come from bigger herds (require matching of population)
- Lack of information – on province affected, population size affected, buffalo population, any early mitigation measures taken?