Biosecurity – Bovine Cysticercosis

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Authorised by:	Group director, Animal Biosecurity	Authorised date:	04/07/2023
Issued by:	Biosecurity and Food Safety	Effective date:	04/07/2023
Category:	Operations and Industry	Review date:	30/06/2026

Scope:

This procedure provides guidance for Local Land Services (LLS) and Department of Primary Industries (DPI) personnel responding to potential contamination/infestation of susceptible food-producing animals, their products or land with *Taenia saginata/Cysticercus bovis* to ensure that risks to public health and exports market are effectively managed.

This procedure is a State Priority for NSW and should be read in conjunction with the policies 'Surveillance for pests and disease of animals', 'Endemic pests and disease of animals' and 'National Livestock Identification System – Cattle sheep, goats and pigs'. The procedure applies to the NSW Department of Primary Industry (NSW DPI), an office within the Department of Regional NSW, and Local Land Services (LLS) in their role as authorised officers under the NSW *Biosecurity Act 2015* (the Act).

Biosecurity legislation summary:

The *Biosecurity Act 2015 (NSW)* promotes biosecurity as a shared responsibility between government, industry and communities. It provides for a flexible, outcome focused approach to managing biosecurity risk and impacts. This means that community members are able to achieve the outcomes of preventing, eliminating or minimising the biosecurity risks and impacts posed, or likely to be posed by pests and diseases of animals through a range of best practice management methods.

People who own or manage animals have a general biosecurity duty for management of the biosecurity risks and impacts associated with endemic animal pests and diseases. The general biosecurity duty is outlined in part 3 of the Act. The biosecurity duty applies to a person who deals with biosecurity matter (including pest animals) or a carrier, and who knows, or ought reasonably to know the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing. Such a person has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised. Section 24 provides an offence of failing to comply with a biosecurity duty.

Clause 61 of the *Biosecurity (NLIS) Regulation 2017* provides authorised officers with the power to assign, amend or change a status on the NLIS register if they know or reasonably suspect that the stock poses a biosecurity risk.

Sources: [Enter sources]

Disclosure of information:

The collection, use and disclosure of information in accordance with this procedure, including any internal or external discussion or distribution of information, must be in compliance with the *Privacy and Personal Information Protection Act 1998* or be authorised by section 387 of the *Biosecurity Act 2015 (NSW).*

Section 387 (2) of the *Biosecurity Act 2015 (NSW)* authorises disclosure of information about a person, without the consent of the person: to a public sector agency, or to any other person, but only if the disclosure is reasonably necessary for the purpose of exercising a biosecurity risk function. The NSW DPI procedure on Collection, Use and Disclosure of Information should be consulted for further information.

Work Health and Safety:

The *Work Health and Safety Act 2011* places an obligation on the agency (NSW DPI and LLS) as a person conducting a business or undertaking and workers to provide a safe and healthy workplace. Safe Work Method Statements that support activities included in this procedure must be used in identifying, assessing, and controlling risks.

NSW DPI and LLS will work together to create a safe and supportive work environment when undertaking any activities for this procedure.

Contents

1. Introduction:

Infestation with *Taenia saginata* (*Cysticercus bovis*) is listed on the National list of notifiable animal diseases and Bovine cysticercosis is listed as a notifiable disease under Schedule 1 of the *Biosecurity Regulation* 2017. The primary reason for regulation is the potential adverse public health impacts as *C. bovis* cysts are the intermediate stage of the human tapeworm *Taenia saginata*. Cattle become infected through ingestion of material contaminated with *T. saginata* eggs passed in the faeces of infected humans. Humans subsequently become infected through consuming undercooked beef contaminated with viable *C. bovis* cysts.

Cattle carcases are inspected for lesions consistent with *C. bovis* cysts at abattoir processing and contaminated carcases are typically condemned. Enhanced meat inspection for *C. bovis* is performed where cattle at high risk of *C. bovis* infection have been previously identified and allocated a CB device status on the NLIS database.

The muscles most commonly affected by *C. bovis* cysts are the heart, tongue, diaphragm and masticatory muscles. The cysts may remain infective for up to 2 years and it is estimated that approximately 10-20% of cysts found at abattoirs are viable.

The prevalence of *T. saginata* in the Australian population is extremely low, however the condition is more common overseas and detections in Australia are most often associated with foreign travellers.

Land is generally regarded as being contaminated for a two-year period after the exposure to inadequately treated sewage or recycled water ceases, because eggs can survive on pasture for extended periods.

NOTE: Variation to this procedure may be considered in individual cases by application to the NSW DPI program coordinator and subject to approval by the NSW CVO.

2. Responsibilities

2.1 DPI and LLS managers must ensure that:

- staff are available to investigate CB detections
- the procedure and supporting materials are regularly reviewed to maintain currency
- risks to the CB program are identified and managed

2.2 DPI animal biosecurity staff will:

- appoint a CB Program Coordinator
- lead the review and publication of the procedure and supporting material
- represent NSW in national forums
- promptly notify LLS DV's of CB detections
- manage the application and removal of CB statuses on the NLIS database
- lead risk assessment following wastewater spills
- manage interstate traces

2.3 LLS staff will:

- notify affected owners/managers of CB detections
- undertake property investigations
- develop and issue IBDs as required
- maintain accurate, up to date records in LHMS

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3. Management of *C. bovis* detections

3.1 Process for handling a *C. bovis* detection

The following steps will be undertaken after the detection of a suspect or confirmed *C. bovis* lesion:

i. CB program coordinator receives notification of a detection (typically from an On Plant Veterinarian or laboratory report), identifies the NLIS number of the affected cattle and collates relevant lab reports

ii. CB program coordinator informs relevant LLS DV of the detection and requests that preliminary tracing and a property investigation is performed

iii. LLS DV undertakes preliminary investigation via interrogation of the NLIS database to identify any potential high risk trace forward animals. This will include examining life histories of the affected animal/animals and other animals which may have been transferred off the PIC and determining whether at risk cohorts may have also left the property. In most situations these details should be verified during the following property investigation (3.1.iv). Where the need to contact high-risk trace forward premises exists (such as livestock transferred to an abattoir), the LLS DV will discuss with the CB program coordinator, who will then contact the relevant party.

iv. LLS DV contacts owner/manager of the source property within three business days and arranges to a undertake a property investigation (investigation form)

    a. Where an owner is unwilling to comply with the investigation, it may be deemed appropriate to apply a CB status using the 'device status for properties' function until such time as a thorough investigation can be performed. This assessment is to be made in consultation with the CB program coordinator and approved by the NSW CVO

v. LLS DV makes an assessment of the likely source of CB on the property and the ongoing risk posed and makes a management recommendation (as per section 3.2) to the CB program coordinator

vi. The recommendation is reviewed by the CB program coordinator for consistency with this procedure and approved; or submitted for approval by the NSW CVO where there is variation from the procedure

vii. Once a management recommendation is approved by the NSW CVO, the CB program coordinator will notify the LLS DV

viii. The LLS DV will liaise with the owner/manager where further actions are required to implement the management recommendations

3.2 Management recommendations

The management of a property following investigation of a *C. bovis* detection will be dependent on the laboratory diagnosis (suspect or confirmed *C. bovis* diagnosis), findings of the property investigation and the ongoing risk of cattle exposure to *T. saginata* contaminated land. The aim of any management action is to ensure human health, export and domestic market risks are managed.

The following is a guide to appropriate management recommendations depending on the outcome of the property investigation. The final recommendations are determined by the investigating LLS DV and communicated to the CB program coordinator through the field investigation form.

i. Likely source of infection identified – localised, and the source will be removed

- a lifetime CB 'device status' is to be applied to the individual NLIS device of any affected cattle (i.e. those that have grazed on the localised affected area during the risk period) and the RFID numbers are recorded in LHMS
- an IBD (or other appropriate instrument) is to be issued to require removal of the source of *T. saginata* contamination and manage any identified ongoing risks as per section 5

ii. Likely source of infection identified – generalised, and the source will be removed

- the CB 'device status for properties' function is to be applied to the PIC to ensure that the individual NLIS device of all existing cattle and any cattle introduced onto or born on the property for two years after the source is removed are allocated a lifetime CB 'device status' and the RFID numbers are recorded in LHMS
- an IBD (or other appropriate instrument) is to be issued to require removal of the source of *T. saginata* contamination and manage any identified ongoing risks as per section 5
- two years after the source is removed, the land is regarded as decontaminated, and the owner/manager may apply to have the CB 'device status for properties' function removed from the PIC

iii. Likely source is identified but unable to be removed

- the CB 'device status for properties' function will be applied to the PIC indefinitely
- an IBD (or other appropriate instrument) is to be issued to manage any identified ongoing risks as per section 5
- if the source is subsequently identified, the case will be managed as per 3.2.i or 3.2.ii as appropriate

NOTE: where a likely source is identified, but a *C. bovis* diagnosis cannot be definitively confirmed, management actions will be subject to a risk assessment undertaken by the CB program coordinator, LLS DV and other relevant parties (e.g., laboratory) and subject to approval by the NSW CVO.

iv. Likely source of infection NOT identified

In some instances, a likely source of *T. saginata* will not be able to be identified despite intensive investigation. In this situation the following actions will apply:

a. Confirmed CB detection in homebred cattle

- the CB 'device status for properties' function is to be applied to the PIC to ensure that the status is applied to the individual NLIS device of all existing cattle and any cattle introduced onto or born on the property for a minimum of two years after the most recent abattoir detection of *C. bovis* and the RFID numbers are recorded in LHMS
- after two years, the land is regarded as decontaminated, and the owner may apply to have the CB 'device status for properties' function removed from the PIC

b. Suspect CB detection in homebred cattle

- CB status is not to be applied to an individual NLIS device where a confirmed diagnosis of CB has not been reached
- the owner/manager will be given advice on managing CB risk and have their Biosecurity Duty explained by the investigating LLS DV

c. Confirmed CB detection in non-homebred cattle

- further investigation of all NSW properties in the life history of the affected cattle will occur (and if the property where infection originated is determined, it will be managed as per section 3.2i – 3.2iii)
- CB status is not to be applied to an individual NLIS device where a confirmed diagnosis of CB is reached, but the property where the infection originated cannot be determined
- owners/managers of all involved properties will be given advice on managing CB risk, the consequences of further detections and have their Biosecurity Duty explained by the investigating LLS DV

d. Suspect CB detection in non-homebred cattle

- further investigation of all NSW properties in the life history of the affected cattle will occur (and if the property where infection originated is determined, it will be managed as per section 3.2i – 3.2iii)
- CB status is not to be applied to an individual NLIS device where a confirmed diagnosis of CB has not been reached
- owners/managers of all involved properties will be given advice on managing CB risk, the consequences of further detections and have their Biosecurity Duty explained by the investigating LLS DV

NOTE: Variation to these recommendations may be considered in individual cases by application to the NSW DPI program coordinator and subject to approval by the NSW CVO.

4. Audit Process

The CB program coordinator will undertake an annual audit of PIC numbers with CB statuses on the NLIS database and will check this list against the LHMS records. This list will be sent to the LLS DVs

and where there are discrepancies between the NLIS database and LHMS, the CB Program Coordinator and LLS DV will work together to investigate and resolve.

5. Management of wastewater spills

Wastewater spills are a potential source of *T. saginata* contamination on grazing land. Where DPI or LLS are notified of these events, an individual risk assessment will be performed by the CB program coordinator in conjunction with the relevant LLS DV and other experts as required to determine appropriate actions to manage the risks to human health, export and domestic markets. The completed risk assessment and proposed controls will require NSW CVO approval.

5.1 Considerations in this risk assessment may include:

- land use/enterprise type
- Access of cattle to the site during the risk period
- Ability to isolate the affected area
- Ability to prevent further spills/contamination
- Environmental conditions

5.2 Management actions may include:

- application of lifetime CB status to NLIS device of cattle that have accessed the site
- application of a CB 'device status for properties' to the PIC for a minimum of two years following removal of the contamination source
- preferentially grazing with a non-susceptible species (e.g. sheep) during the risk period
- exclusion fencing around the affected area with an appropriate buffer zone
- land management practices (e.g. ploughing and re-sowing, liming etc) to reduce pasture contamination levels
- IBD (or other appropriate instrument) to remove source and manage ongoing risk

6. Management of NLIS CB statuses

6.1 Application of CB status

- the need for a NLIS 'device status' or the 'device status for properties' function is determined after a property investigation has been completed
- the investigating LLS DV notifies CB program coordinator of the investigation outcome (through submission of the written field investigation form not more than two business days after the investigation) and may recommend a CB status as per section 3.2
- the CB program coordinator reviews the status recommendation within two business days and if consistent with the procedure approves the change
- where the status recommendation is outside the guidance of the procedure or there is uncertainty around the decision, the CB program coordinator will refer the

recommendation within two business days to the NSW CVO (via a CM9 brief) for review and approval

- once a status application is approved the CB program coordinator will within two business days, notify the LLS DV in writing and apply the status on the NLIS database, and the LLS DV will notify the owner/manager

6.2 Removal of CB status

- the owner/manager may apply to LLS DV to have a CB 'device status for properties' function removed after the minimum time has elapsed. Minimum timeframes will be:
    - Two years after the source is removed where the source was identified
    - Two years after the last abattoir detection where the source was not identified providing some animals have been consigned to slaughter during this period
- the LLS DV assesses the request against the LHMS records, and if in support of the request, recommends the change to the CB program coordinator in writing
- the CB program coordinator reviews the recommendation within two business days and if consistent with the procedure approves the change
- where the status change recommendation is outside the guidance of the procedure or there is uncertainty around the decision, the CB program coordinator will refer, within two business days, the recommendation to the NSW CVO (via a CM9 brief) for review and approval
- once a status application is approved the CB program coordinator will within two business day, notify the LLS DV in writing and apply the status on the NLIS database and the LLS DV will notify the owner/manager

HOW TO – Adding/removing statuses in NLIS: log in to NLIS, select "Help" on the tool bar, select "help tools", select livestock type "cattle', select desired Tech Tip ("device status or "device status for properties") for a step-by-step guide.

Note – NSW DPI program coordinator will require an SDA heavy account to change NLIS statuses.

Definitions and acronyms

the Act	The *Biosecurity Act 2015*
Authorised officer	A person who is appointed as an authorised officer under the NSW *Biosecurity Act 2015* and authorised by that appointment to exercise the function in relation to which the expression is used.
CB	*Cysticercus bovis*
CB status	NLIS device status code for *C. bovis*
CVO	Chief Veterinary Officer
Cysticercus bovis	the larval stage of the human tapeworm *Taenia saginata* found in bovine muscle

DPI	Department of Primary Industries
DV	District Veterinarian
IBD	Individual Biosecurity Direction
LHMS	Livestock Health and Management System
LLS	Local Land Services
NLIS	National Livestock Identification System
PIC	Property Identification Code
RFID	Radio frequency identification
Source property	The property from which the cattle affected with *C. bovis* cattle have come
Localised	Confined or restricted to a particular location
Generalised	Widespread, not confined to a particular location
Suspect CB diagnosis	A lesion clinically suspected to be C. bovis, with histopathological finding of focal myositis consistent with parasitic infection (i.e. with eosinophils present)
Confirmed CB diagnosis	A lesion clinically suspected to be *C. bovis*, with histopathological findings consistent with parasitic infection and *Taenia saginata* (*C. bovis*) detected via PCR.

Documentation

Policy - Information Security (IND-I-197)

Policy – Biosecurity – Collection, use and disclosure of information (IND-O-226)

Policy – Biosecurity - Surveillance for pests and disease of animals (IND-O-220)

Policy – Biosecurity – Endemic diseases of animals (INT21/98789)

Policy – Biosecurity – Livestock Traceability (POL22/29)

Procedure - Biosecurity – NLIS – Managing statuses, errors and data transfers on the NLIS database (INT17/52860)

Procedure - Biosecurity collection, use and disclosure of information (INT17/83863)

Primefact – Bovine Cysticercosis (PUB23/276)

Revision history:

Version	Date issued	Notes	By
1	23/08/2013	INT12/49032	Animal Biosecurity
2	04/07/2023	Significant revisions	Animal Biosecurity

Contact:

Biosecurity NSW – General Enquires - 1800 808 095 - biosecurity@dpi.nsw.gov.au

Appendix 1 – Investigation Form

Department of Primary Industries

Cysticercus bovis Field Investigation

1. Investigating officer details

Name			
Position			
Email			
Phone Number		**Date**	

2. Affected cattle details

Lab report reference number:			
Confirmed or suspect *C. bovis* lesion?			
Further relevant details from the submission: e.g., Prevalence of CB in consignment, comments from On Plant Vet if available etc.			
	NLIS number	**Source** (homebred?)	**Age**
1.			
2.			
3.			
Life history/tracing details:			

3. Property details

Owner's Name			
Manager's Name			
Mobile		**LLS Region**	
Phone		**Email**	
Postal Address			
Trading Name			
Property Name			
Property Address			
PIC			
Are there other holdings on this PIC? If so, provide details.			
Enterprise types present on the property			
Property description e.g. location, water courses, sewerage, camping spots etc May be useful to include a map where possible.			

4. Possible sources of *C bovis* infection

Bovine cysticercosis results from exposure of cattle to untreated human feaces and wastewater containing eggs of the human tapeworm, *Taenia Saginata*. The following table contains suggestions for possible sources of *T. saginata* on the property. You should ask questions about these possible sources to determine if they pose a risk in this particular case (suggested questions are included in Appendix 1). You may also need to inspect areas and items that relate to these such as the sewerage outlet.

Possible Source	Notes
Sewerage/wastewater - Domestic - Nearby sewerage treatment works	
Supplementary stock feeds (particularly imported feeds)	
Campers or other recreational users	
Overseas travellers	
Movement of cattle to and from other properties	
Other	

5. Final assessment and recommendation

What is the outcome of this investigation?	☐ Source identified (localised) ☐ Source identified (generalised) ☐ Source not identified
Recommendations (These should be based on Procedure - Bovine Cysticercosis section 3.2)	
Comments	
Recommending District Vet - Name	
Signature	
Date	

6. Record keeping

Save this form in a LHMS event for the property, remembering to also attach relevant lab reports

LHMS ref. no.	

7. Submitting the form

Email a scanned copy to animal.biosecurity@dpi.nsw.gov.au marked: “Attention: Cattle Health Coordinator”

8. Questions to guide investigation:

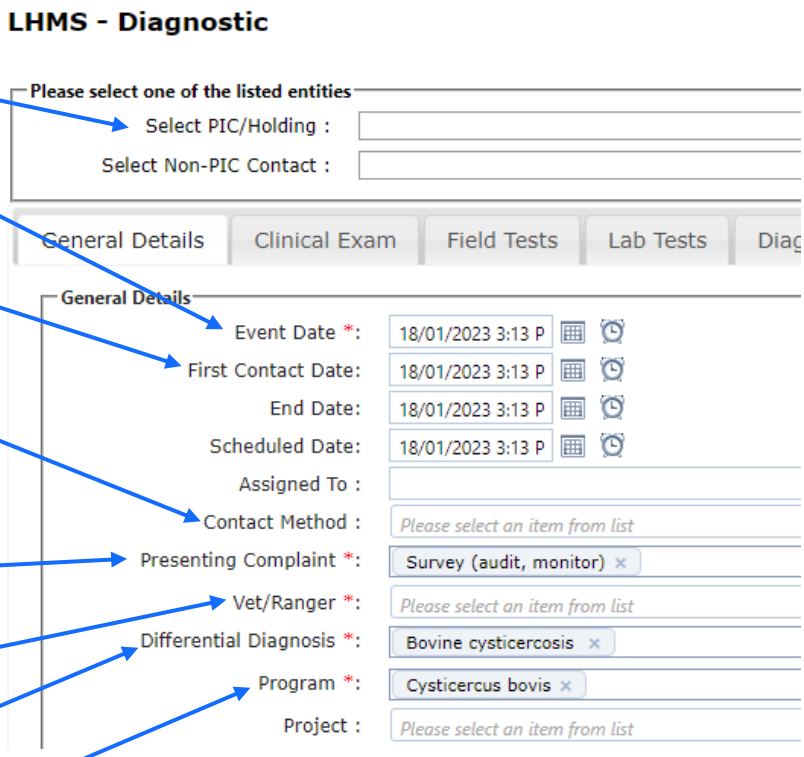
Possible Source	Suggested questions
Sewerage/wastewater - Domestic - Nearby sewerage treatment works	• Is there any evidence of leakage from your domestic sewage system? • Do cattle on your property have access to grazing around the domestic sewage system? • Is treated water or sludge from a Sewage Treatment Works used on your property? • Is there a Sewage Treatment Works located near your property?
Supplementary stock feeds (Particularly imported feeds)	• In the past 2 years, have any imported stock feeds been fed to cattle on your property?
Campers or other recreational users	• In the past 2 years, have any tourists travelled through or camped on your property?
Overseas travellers	• Have any residents or visitors to your property in the past 2 years come from or travelled overseas in the past 25 years? • If so, what country(ies)?
Movement of cattle to and from other properties	• Were the cattle in questions moved to other holdings or properties?

Appendix 2 – Entering *C. bovis* investigations into LHMS

All *C bovis* investigations must be entered into LHMS as a 'Diagnostic' event.

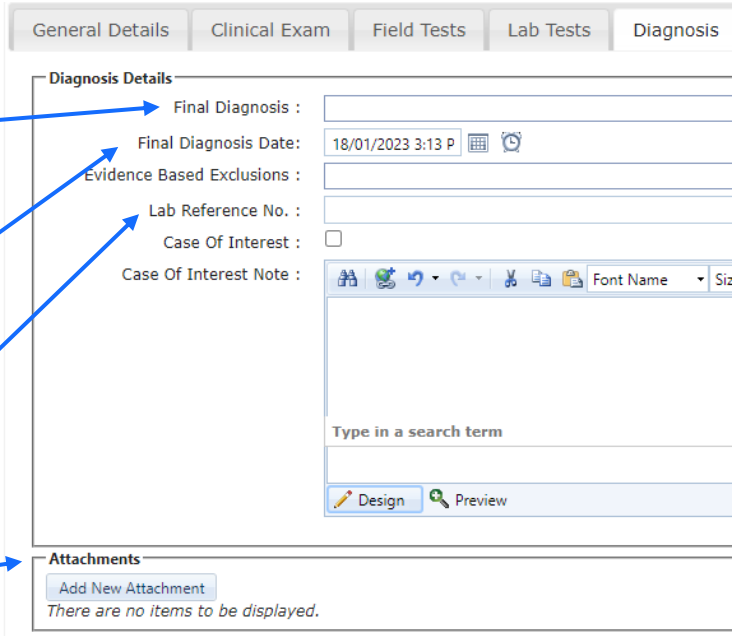
General details

PIC	PIC of property being investigated
Event date	Date of the investigation
First contact date	Date investigating LLS DV notified of case by DPI
Contact method	Method of investigation – 'property visit' or 'phone'
Presenting complaint	'Survey (audit, monitor)'
Vet/ranger	LLS DV name
Differential diagnosis	'Bovine cysticercosis'
Program	'Cysticercus bovis'



Diagnosis

Final Diagnosis	Confirmed cases – 'Bovine Cysticercosis' Suspect cases – 'No Diagnosis'
Final Diagnosis date	Date on Final laboratory report
Lab reference number	Lab reference number(s)
Attachments	Ensure lab results are attached



Advice/Plan

Advised by	Select method by which owner is notified of the final plan
Advised date	Date that owner is notified of the final plan
Advice/Plan	See notes in example
Attachments	Field investigation form IBD or other appropriate instrument (if required)