



Integrity Systems

red meat customer assurance



Livestock Production Assurance

Risk Management of *Cysticercus bovis* in LPA and NLIS



Overview

Wastewater treatment plants may supply recycled water from human effluent for re-use depending on the level of treatment the water undergoes.

One use for recycled water is to provide it to livestock producers to irrigate grazing land or to supplement livestock drinking water.

For this document, recycled water refers to water recycled from sewage or other water sources containing human faecal material. Recycled water supplied from a wastewater treatment plant to a producer should only occur under a written agreement. Recycled water excludes on-farm household greywater and septic systems, which cattle should be prevented from accessing, or stormwater.

Recycled water that isn't adequately treated according to Australian Guidelines for Water Recycling (AGWR) for helminth egg control is deemed high risk as it may contain *Taenia saginata* (*T. saginata* or beef tapeworm) eggs which can cause beef measles (*Cysticercus bovis* or *C. bovis*) in cattle.

C. bovis poses a food safety risk to humans and infected carcasses can be partly or fully condemned at processing.

At processing a full inspection procedure of carcasses is carried out in accordance with Australian Standard 4696:2023. This requires the incision of both the heart and masseter muscles of cattle and inspection of all exposed muscle surfaces to check for *C. bovis* infection which reduces the usability of these cuts. Where detected, Schedule 3 of AS 4696:2023 requires trimming and condemnation of lightly infected material, however detection of numerous suspect cysts results in condemnation of the entire animal.

To reduce the need to routinely incise the masseter muscles off all cattle, industry and government have implemented a risk framework to:

- identify enterprises which use 'high-risk' recycled water in relation to *C. bovis*.
- ensure only cattle from high-risk properties receive the full inspection procedure detailed in AS 4696:2023.
- ensure cattle from low-risk properties in relation to *C. bovis* receive the routine inspection detailed in AS 4696:2023 and be able to increase the sale of masseter cuts.

The LPA program is introducing the management of risk related to recycled water use to ensure only cattle from properties using high-risk recycled water are subject to increased inspection at processing.



Cattle Producers



- Producers who use recycled water for irrigation or cattle drinking water need to demonstrate the recycled water does not pose a risk to food safety.
- This shall be demonstrated through conformity to Element 1 of LPA - Property Risk Assessment.
- Producers being supplied with recycled water from a wastewater treatment plant need to:
 - Include recycled water use in their property risk assessment.
 - Indicate on their farm map where recycled water has been applied.
 - Obtain in writing from the wastewater treatment plant the treatment level of the recycled water (agreement or contract) .
 - Demonstrate through the agreement that the recycled water is low risk and has been treated to achieve a:
 - Log Reduction Value (LRV) of 4.0 in *T. saginata* egg concentration or equivalent; or
 - LRV of 3.0 - only if the producer is supplying other fresh drinking water to cattle. The recycled water supplier must confirm that the sewage quality is ≤ 1 *T. saginata* egg/L, as part of the supply agreement.
- If exposed to inadequately treated recycled water cattle need to be identified, traceable and declared as exposed to *C. Bovis* on outgoing NVDs.
- ISC will send LPA auditors to audit producers to verify the treatment level of recycled water in use where *C. bovis* is detected at processing. State / territory officials will manage detections for all non-LPA accredited producers.
- Producers verified as using inadequately recycled water will have a:
 - **CBP** status applied to their PIC in the NLIS Database; and
 - **CBA** status applied to all cattle devices on their PIC.
- The **CBA** device status will remain on the device for the animal's lifetime to instruct the processor of the correct inspection procedure to follow at processing.
- The **CBP** status can only be removed from a PIC once an LPA auditor verifies it has been two years since inadequately treated recycled water use has ceased on the PIC or a state/territory official removes the status through a risk assessment.
- If cattle with a CBA device status reside on a property when the CBP status is removed, a CBW status will be applied to the PIC until all CBA devices are moved off the property.

- Unused NLIS identification devices that have a CBA status when a CBP status is removed can have the CBA status removed by ISC on provision of the list of unused devices verified by the LPA auditor.
- Cattle that lose an NLIS identification device while on a property of birth will be re-tagged with the breeder tag from that PIC. Cattle that lose their tags will assume the status of the animals of the lot it is being sent with, which is to be verified using NVDs by the processor.
- Producers who buy cattle with a CB status will have a CBW status applied to their PIC which is a warning that CB cattle reside on the PIC. Once all CB cattle have moved off the PIC, the CBW status will be automatically removed.



Saleyards and feedlots



- Using NLIS, feedlots will be able to see if a PIC they are purchasing from has a CBP or CBW status.
- If CB cattle are transferred onto a saleyard or feedlot PIC, the PIC will receive a CB Warning (CBW) status to indicate that cattle with a CB status have been moved onto the PIC.
- The saleyard, feedlot and any processor buying cattle can check if cattle have a CB status, the PIC has a CBP or CBW status.
- The CBW status will be removed automatically when all cattle with a CB status are moved off a PIC.
- Cattle that lose an NLIS identification device will assume the status of the animals of the lot it is being sent with, which is to be verified using NVDs.

Processors



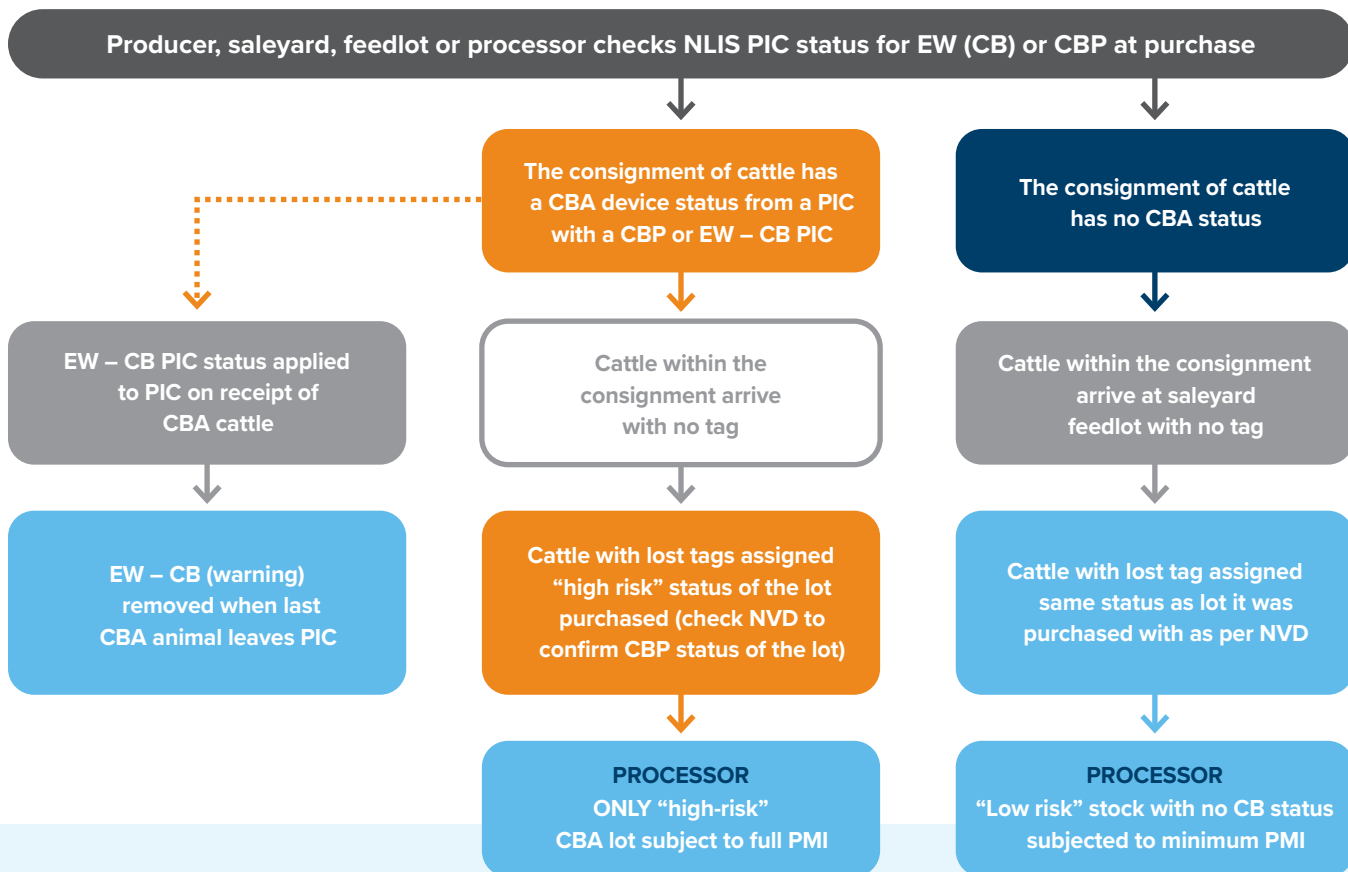
- Using NLIS, processors will be able to see if a PIC they are purchasing from has a CBP or CBW status and further check if livestock being received have a CB status.
- AS 4696:2023 details that a full, organoleptic post-mortem inspection (PMI) is applied to animals for *C. bovis* where reasonable evidence of contamination (e.g. suspect cyst found in incised heart) is provided. This consists of incision of hearts, masseters, tongue, diaphragm after removal of serous membranes and observation of all muscle surfaces.
- Where a device has a CB Status, or livestock have come from a CBP PIC, all material inspected at PMI suspected of being infected with CB is trimmed and condemned.

If general carcase infestation is suspected, the entire carcase is condemned.

- Where no CB device status exists a routine post-mortem inspection PMI for CB will be applied according to AS 4696:2023. This will consist of routine heart incision to examine for evidence of suspect cyst with observation of masseter muscle (no mandatory incision required for routine PMI) to examine for evidence of cysts.
- Cattle that lose an NLIS identification device will assume the status of the animals of the lot it is being sent with, which is to be verified using NVDs.

Identification of possible CB cysts in a carcase will result in Chief Veterinary Officer (CVO) notification in all cases, as CB is notifiable in all jurisdictions.

Cattle with *Cysticercus bovis* (CB) device status and lost tags



LEGEND

PIC = Property Identification Code.

NVD = National Vendor Declaration.

NLIS = National Livestock Identification System.

Low risk PIC/cattle – cattle that have had no exposure to CB (via recycled water containing human effluent).

High risk PIC/cattle – cattle that may have had exposure to CB (via recycled water containing human effluent) – AS 4696:2023.

CBA status – under new risk management arrangements (AS 4696:2023) these will be stock that may have been exposed to CB. PIC will have CBP status and animals will have Device Based (DB) Status on NLIS.

CBA – Device based animal status (tag).

CBP – CB PIC based status on NVD form.

EW – CB warning on NLIS database to flag PIC. (EW = Early warning, CB = *Cysticercus bovis*)

POST-MORTEM INSPECTION (PMI) OPTIONS (AS 4696:2023)

Minimum PMI – Incise heart, observe masseters.

Full PMI – All animals with CB device status require post-mortem inspection specific to detect *C. bovis* with incision of heart and masseter muscles, tongue and diaphragm and observe all exposed muscles.

States and territories



- States and territories will verify the use of recycled water for any non-LPA accredited producers if a *C. bovis* is detected at processing.
- Jurisdictions will investigate potential detections through supply chain investigations (i.e. identify if a likely source is evident in the animals' life movements), and if so, possibly send samples of cysts for laboratory analysis to provide for formal diagnosis of *C. bovis*.
- States and territories may remove CBP status where a jurisdictional risk assessment is carried out.

ISC and LPA auditors



- ISC will send an LPA auditor to verify the use of recycled water by an LPA accredited producer if *C. bovis* is detected at processing.
- ISC will apply the **CBP** status in the NLIS database to an LPA accredited producer's PIC that:
 - are using inadequately treated recycled water; or
 - refuse an LPA audit to verify recycled water use.
 - The **CBA** status will automatically be applied to all cattle devices when a CBP PIC status is added.
- An LPA auditor shall verify that inadequately treated recycled water has not been used on the PIC for two years before ISC can remove the **CBP** status, or a risk assessment approved by the relevant state authority, i.e. CVO or equivalent, indicates a shorter time period is appropriate.
- The **CBA** status can only be removed by ISC from **unused** cattle devices that are registered on the PIC when the **CBP** status is removed if the unused device list is verified by the LPA auditor.

Wastewater treatment plants



- Wastewater treatment plants have environmental licences with state / territory governments for the treatment and release of recycled water.
- The AGWR detail the treatment and re-use options available for recycled water which wastewater treatment plants utilise.
- One area of risk that is not addressed well by these Guidelines is the re-use of water in relation to livestock grazing.
- Industry and government have worked to implement this risk management framework for the use of recycled water for livestock grazing to supplement these guidelines.
- If a wastewater treatment plant's environmental licence allows it to release water for livestock grazing, the state or territory environmental agency is informed and should advise the state agriculture departments, or equivalent.
- Wastewater treatment plants should enter into agreements for the supply of recycled water with a producer and provide the producer with the information on the treatment level achieved for *C. bovis*.
- Specifically, whether the recycled water being supplied to the producer has been treated to achieve a:
 - Log Reduction Value (LRV) of 4.0 in *T. saginata* egg concentration or equivalent; or
 - LRV of 3.0 in *T. saginata* egg concentration where the source water containing human effluent is confirmed by the provider as containing a concentration of ≤ 1.0 *T. saginata* eggs per litre. In this instance, the producer must also be supplying other fresh drinking water to cattle.
- This is required so producers know what measures to put in place to mitigate the risk of beef measles in cattle.



www.integritysystems.com.au • 1800 683 111 • lpa@integritysystems.com.au