

Paunch Contents Land Spreading Management Guidelines

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ENVIRONMENT PROTECTION AUTHORITY

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1. Purpose

These Guidelines have been prepared for Tasmanian abattoirs, controlled waste transporters, landowners and environmental regulators concerned with the re-use through land application of partially digested material from ruminant stomachs known as paunch contents. Paunch contents can be a valuable soil conditioner when managed and applied appropriately. However, it can also give rise to environmental and human or animal health risks which need to be addressed before land spreading occurs.

The Guidelines do not approve the application of paunch contents to land. Rather, the document provides supporting information to facilitate compliance with Permit, Environment Protection Notice and other regulatory instrument conditions for managing risks that can be associated with paunch contents.

2. Regulatory Requirements

Paunch contents is the undigested food contained in the stomach of ruminant animals. It consists mainly of undigested grass, hay, other feed products such as grain, and water as well as body fluids, including saliva. Paunch contents do not include the stomach (rumen) itself.

Paunch contents are classified as a controlled waste under the *National Environment Protection (Movement of Controlled Waste between States and Territories) Measure 2010*, as per:

- List 1 (K100 Animal effluent and residues); and
- List 2 (6.2 Infectious substances – Substances or wastes containing viable micro-organisms or their toxins which are known or suspected to cause disease in animals and humans).

Environmental risks potentially arising from paunch contents include soil, surface water and groundwater nutrient contamination, as well as odour generation. Paunch contents also contains micro-organisms, some of which may be disease-causing. The main pathogens which could be carried in paunch contents and impact upon on human or animal health include *Salmonella* spp., *Yersinia* spp., *Campylobacter* spp., *Leptospirosis* spp., *E. coli*, *Cryptosporidia*, and agents causing Toxoplasmosis, Johnes Disease, and Transmissible Spongiform Encephalopathies (TSEs).

These Guidelines support compliance with Tasmania's controlled waste handling and management requirements by outlining environmental and animal health safeguards relevant to the application of paunch contents to land as a beneficial soil conditioner.

It is a legal requirement that approval is obtained from Local Government or EPA Tasmania to reuse paunch contents on land.

Paunch contents composting and land application by Level 2 abattoirs is regulated by the EPA Tasmania through imposition of conditions via Permits or Environment Protection Notices (EPNs) issued under the *Environmental Management and Pollution Control Act 1994* (EMPCA). Level 1 abattoirs regulated by local government may also be subject to conditions imposed via Permits and EPNs under EMPCA.

In addition, the Australian Government bans the feeding of Restricted Animal Material (RAM) to ruminant animals for disease prevention purposes, given effect in Tasmania under the Tasmanian Animal Health Act 1995 in which paunch contents is classified as RAM. Therefore, composting operations and land application must be managed for adequate stock exclusion.

3. Paunch Characteristics

In most abattoirs, paunch contents are washed out of the rumen, and subsequently recovered from the effluent stream by screening (CSIRO Meat Research Laboratory, 1993). About 2 m³ of dewatered paunch contents is produced per 100 head of cattle slaughtered.

Typical characteristics of paunch contents extracted at abattoirs include:

Biodegradability

The organic waste solids in paunch are very suitable for biological treatment (for example by composting) to produce stable, useful products. Good management of the treatment process is required to minimise environmental problems such as nutrient-rich leachates reaching soil, surface water or ground water, odour and vermin.

Moisture

Paunches are washed out and therefore the contents tend to have very high moisture content (>85%). This makes paunch contents vulnerable to microbial activity and odour production. Care is necessary to avoid contaminated liquid spilling during transport and processing. A press may be used to dry the paunch for easier handling.

Nutrients

Paunch contents contain valuable nutrients including carbon (12.6 %) and nitrogen (3-3.5 mg/g). Good procedures are needed to prevent nutrient loss through leachate and volatilisation.

Microorganisms

Paunch contents contain high levels of microorganisms, potentially including pathogens. A well-managed treatment process is essential to ensuring that the final product is safe for use.

Toxic compounds and heavy metals

Paunch contents generally contains negligible levels of these compounds.

Acidity

Paunch pH is neutral at around 7.0.

(Source: *Waste Solids Environmental Best Practice Manual*, Australian Meat Processor Corporation, undated).

4. Treatment

4.1 Pre-treatment and application options

Paunch contents should be dewatered to the extent suited to subsequent transport and processing. Different dewatering systems will produce material of differing moisture content. Dewatering systems in order of decreasing moisture content after dewatering are: vibrating screen, wedge wire screen, screen press and screw press.

The more moisture removed from paunch contents, the greater the amount of nutrient loss to liquor. As a method of re-use or disposal of this liquor it is recommended that it be collected and used to add moisture back to the latter stages of a composting operation, if present, rather than directing this stream to on-site wastewater or sewage systems (Meat and Livestock Australia, 2007).

Provided relevant environmental and animal health protection conditions are met (Sections 4-10), the following paunch treatment methods may be approved in Tasmania:

- Applied wet, directly to pasture, by a tanker or trailer;
- Dried/screened and applied using a spreader; or
- Composted prior to being land spread.

4.2 Segregation from meat and treatment

4.2.1 Risks

Ruminant stomachs are generally slashed, emptied and washed with water so that edible products and material suitable for rendering can be recovered. Various pathogens representing a risk to humans and/or animals may be present in the paunch contents as well as in blood and tissue remnant

contamination from the slaughtering process. When spread on pasture, paunch contents may be ingested by grazing animals unless appropriate management occurs.

4.2.2 Risk Management

Paunch contents should be adequately segregated from the rest of the carcass at the abattoir, such that no mixing occurs. In addition, the contents should be treated to reduce the pathogen load either by composting to the current version of the Australian Standard 4454 Composts, soil conditioners and mulches or treated with lime to a pH of 12, for instance by addition of hydrated lime. No grazing animals should be able to access stored paunch contents. Grazing of pastures should not occur before at least minimum 42 days and until spread paunch contents have been absorbed into the soil and are no longer visible on the soil surface. Turning in and establishing a crop on the area is an acceptable alternative use to grazing.

4.3 Transport

4.3.1 Risks

Transporting paunch contents has potential to cause odour nuisance and nutrient contamination via spills to roads, property and waterways. Spillage may also present a risk to human and animal health.

4.3.2 Risk Management

Transport routes, times and vehicle type must be planned to avoid public nuisance, particularly with respect to odour. In Tasmania, only businesses that are registered to handle Controlled Waste category K100, may transport paunch. Registration as a Controlled Waste Handler for K100 is subject to compliance with conditions for preventing and managing odour and spill risks during transit and loading/unloading. Spills kits must be carried by these vehicles. Procedures must be followed, and monitoring and reporting systems must be implemented to ensure that the material is disposed of correctly.

4.4 Storage

4.4.1 Risks

Paunch contents, if not stored appropriately, may contaminate waterways or groundwater and potentially cause public nuisance, particularly with respect to odour, and attracting vermin.

4.4.2 Risk Management

The material should preferably be stored in a bunker with a sealed floor in which any leachate or rainwater is collected and directed to appropriate and approved wastewater treatment facilities. If stored on the ground, a compacted earthen or concrete pad should be used to prevent leaching into the ground.

Under most circumstances, a cover is not normally required. However, if odour or vermin become an issue, the material may be covered with a layer of inert material such as bark or woodchips.

4.5 Composting

4.5.1 Risks

Composting is a means of reducing pathogens and environmental risks associated with paunch contents. However, if not managed well, composting itself may result in odour nuisance, animal and human health risks, leachate entering the natural environment, and increased vermin.

Properly composted paunch contents which meets Australian Standards AS 4454–2012 Compost, soil conditioners and mulches is not classified as a Controlled Waste and therefore the land spreading criteria in these guidelines do not apply.

4.5.2 Risk Management

To remove pathogen risks to humans and animals, the composting process must involve the paunch contents and/or other carbon-rich materials, undergoing a process of managed biological transformation:

- to achieve pasteurisation (a process whereby organic materials are treated to significantly reduce the numbers of plant and animal pathogens)
- for a period of not less than a total of 6 weeks of composting and curing, and/or
- until an equivalent level of biological stability to (a) and (b) can be demonstrated.

Stock must be excluded from the composting area, and an impervious pad used to prevent leaching into the ground. All runoff should be collected for treatment. Management of carbon to nutrient ratios (e.g. C:N), monitoring temperature and turning for air circulation will assist in preventing odour nuisance.

5. Land Application

5.1 Site selection

Site selection should consider impacts potentially associated with proximity to residences, recreational areas, industrial activities, and other sensitive areas, and other environmental factors such as depth to groundwater and distance to waterways.

For optimal results, paunch contents should be applied to fallow land as close as possible to the time of sowing pasture or crops. Spreading in winter should be avoided as nutrient demand is lower and increased rainfall and soil saturation increases the risk of nutrient leaching and run-off.

5.2 Application rates

Assessment of the site specific capability of the land, including soil analyses to determine the Nitrogen Limiting Application Rate (NLAR), should be undertaken by an agronomist to establish the paunch contents (or compost) application rate appropriate for the land and associated climatic and environmental considerations.

It is essential that the landholder is involved in this assessment and has an understanding and commitment to adhere to the determined application requirements.

5.3 Exclusion zones

Buffer zones are required between paunch contents application sites and the surrounding landscape, as detailed in Table 1.

Table 1: Minimum buffer distances (Source: *Tasmanian Biosolids Reuse Guidelines 1999*)

Feature	Buffer zone (m)
Surface water bodies other than farm dams	100
Farm dams	30
Drinking water bores	250
Other bores	50
Farm driveways, access roads and fence lines	10
Native forests and other native vegetation types	10
Animal enclosures	50
Occupied dwelling	100
Residential zone, urban areas	500

5.4 Animal Health Protection Measures

5.4.1 Risks

Ruminant protein may contaminate paunch contents at the abattoir and subsequently be ingested by stock after it has been spread on pasture. Paunch contents also contain high levels of micro-organisms including bacteria and pathogens. Land spreading therefore has potential to contribute to the distribution or intensification of, or reduced resistance to, significant animal disease in ruminants.

5.3.2 Risk Management

Paunch contents spreading on land must only be carried out under approval granted via a Permit or EPN, supported by a formal, written agreement between the spreading contractor and the property owner. An agreement must ensure a suitable stock exclusion period to negate the risk of disease transmission.

There is little risk of disease transmission from the application of paunch contents to pastures provided that:

- hydrated lime is added to bring the pH to 12 or the material is composted according to the Australian Standard AS4454 Composts, soil conditioners and mulches
- the spreader's tank is flushed after spreading and wash water is contained and treated as for paunch contents
- the spread material is no longer visible on the ground i.e. it has been absorbed by the soil or it has been turned in and a crop has been established, and
- the specified 42-day post application non-grazing period is observed on the farms on which paunch contents is spread.

5.5 Paunch Contents Land Spreading Management Plan

Permit and EPN conditions issued by the EPA may include a requirement to prepare a Management Plan for the activity. As a guide, the following or similar permit requirements must be met before spreading commences.

1. A Management Plan for land spreading of paunch contents must be submitted to the Director within 120 days of the issue of this Notice. The Management Plan must include, but is not limited to:
 - 1.1 Details and map of the receiving property, including proximity of nearby watercourses, residences and roads;
 - 1.2 A signed agreement with the property owner;
 - 1.3 Approximate volume of paunch contents and screenings (per day and annually);
 - 1.4 Methods of collection and treatment;
 - 1.5 Transport details;
 - 1.6 Method of application, including spreading rates;
 - 1.7 Explanation of the record keeping system;
 - 1.8 Animal health protection measures, including stock withholding periods; and
 - 1.9 Other matters as set out in the Paunch Contents Land Spreading Management Guidelines (Tasmania).
2. The person responsible must implement and act in accordance with the approved plan.
3. In the event that the Director, by notice in writing to the person responsible, either approves a minor variation to the approved plan or approves a new plan in substitution for the plan originally approved, the person responsible must implement and act in accordance with the varied plan or the new plan, as the case may be.
4. Checklist for appropriate paunch contents treatment and land application

Table 2 provides a general checklist for use when seeking approval to treat and land spread paunch contents. Note: this checklist should be used as a guide. Additional information may be required before a decision is made.

Table 2. Checklist for identifying the risks associated with paunch contents treatment and land spreading

Risk	Risk Management	Has the risk management step been taken? If yes, provide documentary evidence.	If no, explain alternative proposed risk management	Notes
Abattoir				
Odour nuisance from high water content Spillage in transport	Is the paunch contents de-watered and what method is used?	Yes / No		
Litter nuisance	Is screening to remove rubbish and non-biodegradable material in place?	Yes / No		
TSE	Are measures in place to prevent mixing of paunch contents with ruminant protein?	Yes/No		
Pathogens	Is paunch material treated with lime to increase pH?	Yes / No		
Nutrient loss to soil, surface waters, ground water	Is an impermeable base and leachate collection system provided for stockpiled or composted paunch material?	Yes / No		
Transport				
Spillage and odour during transport	Is the vehicle used registered as a Controlled Waste Handler for category K100	Yes / No		Registration Number:
Land Spreading				
Landowner doesn't understand proposed management regime	Is a signed agreement in place with the receiving landowner?	Yes / No		
Pathogens and odour	Is the paunch contents composted or stabilized prior to spreading	Yes / No		
Incorrect application rate	Has soil testing been undertaken for the receiving land?	Yes / No		

Disease transmission	Is a 42-day stock withholding period applied?	Yes / No		
Odour, nutrient loss to waterways	Have application buffer zones been established?	Yes / No		
Management and Review of Operations				
Contractor, landowner do not follow management regime	Are Standard Operating Procedures developed and provided to employees, contractors and landowners?	Yes / No		
Management regime not implemented as planned	Is a process for monitoring and review of the system established?	Yes / No		

6. References

Abattoir Waste-water & Odour Management (Solid Waste Disposal), CSIRO Meat Research Laboratory, 1993.

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Disease Risk of Spreading Paunch Material on Pastures, Bruce Jackson, Senior Veterinary Officer, Emergency Animal Disease, DPIPWVE, 23 July 2007.

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