

# Methods for handling dry dumped paunch contents

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## Cleaning paunches

The process of emptying and cleaning cattle paunches in the abattoir is a water intensive operation. The first stage of cleaning cattle paunches is normally washing the contents out over an umbrella washer. This alone can use 50 litres or more of water per paunch. The contents are then separated from the effluent stream by mechanical screening. However fine particles pass through the screen and soluble nutrients remain. These can contribute 16 to 30 g phosphorus and 20 to 70 g of nitrogen per paunch to the effluent loading.

Dry dumping of cattle paunches has been advocated for many years. However there has been only a limited uptake of this procedure as the traditional process is simple and conveying the solids by water is an easy means of removing them from the paunch-emptying site. There has recently been an upsurge in interest in dry dumping as a means of reducing water usage and effluent nutrient loading. It has been estimated that dry dumping will reduce the nutrient contribution from this process by 10 to 12 % and water usage by about 45%.

## Dry dumping problems

One of the main technical difficulties with dry dumping is transferring the paunch material from the emptying site to a collection vessel. Paunch material is highly variable by nature. The consistency and concentration of the solids will depend on the type of feed consumed and the length of time since the last feed. For example, 24 hours off feed will reduce the total solids level of the contents by 50% from around 8% to about 4%. The selection of the most suitable transfer means will be influenced by the solids content of the material, the distance to be moved and whether there is a change in level. For example pumps and pneumatic conveyors may not be suitable for very dry material and screw conveyors would have difficulty elevating wet

material. The location of the paunch room in relation to the collection vessel and the space available below the emptying sink will have a major bearing on the suitability of the various options.

It is also important to decide whether the paunch material is to be dewatered or whether the paunch liquor is collected along with the solids. The subsequent treatment or disposal method will determine this. Dewatering will reduce the volume and weight and assist with subsequent treatment such as composting but reductions in effluent nutrient loading from dry dumping will be largely nullified. However it may be possible to collect the water separated from the paunch material for subsequent addition to the drying compost.

## Conveying and de-watering options

Some suggested paunch-conveying and dewatering options are discussed in Table 1, which also includes some suppliers of suitable equipment. Some of these have been used in Australia and New Zealand whereas others such as vacuum collection have not been trialed to our knowledge.

## Further information

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**Table 1. Paunch conveying and dewatering options**

Transfer Method	Suppliers	Comments
Dewatering screw press ↓ Screw conveyor	Spirac Engineering Pty Ltd PO Box 6643 Baulkam Hills BC NSW 2153  Jacmor Engineering Pty Ltd 136 Bell Street Preston VIC 3072  Envirocare Wastewater Systems International Pty Ltd 12 Mulgray Ave Maroubra NSW 2035	Limitations on distance material can be economically conveyed.  The press water will flow to effluent or may be collected for addition to compost.
Pneumatic conveyor ↓ Blow tank		Variable nature of material may require confirmation trials.  May be difficult to fit blow tank into existing plant configuration.  Paunch liquid mixed with solids may cause disposal problems.
Pneumatic conveyor ↓ Rotary valve		Able to convey over long distances.  High energy use due to continuous operation.
Pneumatic conveyor ↓ Dewatering screw press	Spirac Engineering Pty Ltd,  Envirocare Wastewater Systems International Pty Ltd	May be difficult to fit blow tank into existing plant configuration.  Used on small plant in NZ.
Hydraulic press ↓ Pneumatic cannon	Food Processing Equipment (FPE) Pty Ltd PO Box 247 Ingle Farm SA 5098	Used in Europe, but difficult to obtain information in Australia. Has the advantage that it can fit into areas with a low headspace.
Rotating screen	Contra-Shear Technology Pty Ltd 5 Houghton St Linley Point NSW 2066	Only applicable to short distances such as through a wall.
Pump ↓ Trash pump	Airdraulic Birco Group Pty Ltd PO Box 833 Crows Nest NSW 2065	Additional water may need to be added if material is dry.  Foreign objects in the paunch material may foul the pump.
Vacuum	Russell & Sons Pty Ltd 18a Goggs St Toowoomba QLD 4350	Mobile pressure vessel required (\$15,000 total).  Material may require dewatering prior to treatment or disposal.