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AUSTRALIAN MEAT PROCESSOR CORPORATION

WATER EFFICIENCY PROJECTS

A key issue to consider when looking at water efficiency projects is the total cost of water. Most sites look only at the cost of supply, but there are other costs which can be just as significant, such as:

- In-house treatment – for boiler feedwater, cooling towers, re-use;
- Pumping costs;
- Onsite treatment costs – operation and maintenance costs of save all, DAF;
- Disposal costs – to sewer, irrigation.

Depending on the plant configuration, water can be pumped between 5 – 7 times from when it enters the plant to when it leaves, so the electricity used in moving the water around the plant can be a significant cost which is often overlooked.

When considering how to reduce the overall consumption of water, it is worthwhile considering reusing water for applications where quality requirements are lower. AQIS Meat Notice 2008/06 includes examples of reuse processes which have already been approved and they include:

- Steriliser and hand-wash water collected and used to wash cattle yards;
- Carcase decontamination wash water collected, coarsely filtered and reused immediately for the same purpose whilst maintaining a temperature that is lethal to pathogens;
- Steriliser water collected from clean end of the viscera table and used for the initial viscera table wash;

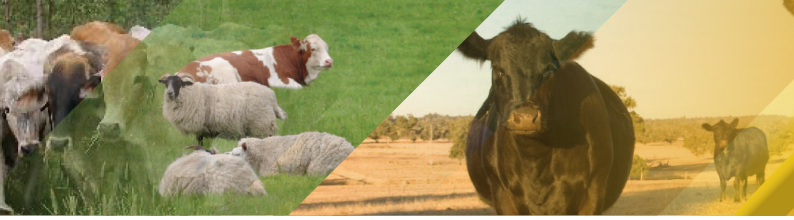
- Steriliser water collected and used to wash moving dry landing area (hide on area);
- Tertiary treated effluent water used as the initial wash in the ante mortem yards and as an initial wash of stock;
- Chlorinated tertiary treated water used as a final wash in ante mortem yards and as final wash of stock.

In addition, non-potable water may be used for purposes such as irrigation, garden watering, toilet flushing and washing down external areas as long as local laws allow it.

Reuse opportunities identified in the Eco-Efficiency Manual for Meat Processing (2002) include:

- Freezer defrost water being used for cooling tower makeup;
- Handwash basin water used for rendering material conveyor chutes or sprays on trammel screens;
- Carcase wash, viscera table wash and edible offal wash water being used for rendering plant washdown, odour scrubbers, stockyard washing and truck washing;
- Head wash water being used for gut washing.

Further references
www.redmeatinnovation.com.au
AMPC Excel Calculator

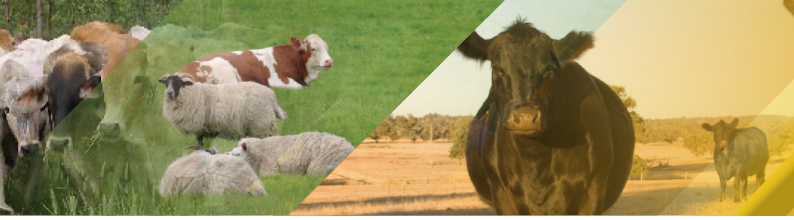


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WATER EFFICIENCY PROJECT WITH INDICATIVE PAYBACKS	PAYBACK (YRS)	SOURCE
Replace shower heads with more efficient type	0.1	ENV103Pt2
Fit evisceration table with reduce flow nozzles	0.1	ENV103Pt2
Fit flow restrictors onto water to sterilisers	0.1	ENV103Pt2
Fit flow restrictors onto water to hand wash stations	0.1	ENV103Pt2
Fit slaughter floor final wash with reduced flow nozzles	0.2	ENV103Pt2
Fit slaughter floor Y-cut faucet with flow reduction nozzles	0.3	ENV103Pt2
Fit slaughter floor at evisceration pluck with foot operated valve	0.3	ENV103Pt2
Replace two gear sterilisers with one steam heated, insulated steriliser	0.6	ENV103Pt2
Recover clean wastewater from abattoir, reuse at Rendering Plant	0.8	ENV103Pt2
Connect water flow meters to CITECT, establish monitoring systems and alarm feedback to operators	0.9	ENV103Pt2
Replace hot water pipes to reduce hot water waste	0.9	ENV103Pt2
Boiler Feed Water recovery from condensate water return from abattoir	1.1	ENV103Pt2
Replace steriliser nozzles in processing areas	1.1	ENV103Pt2
Reduce size, insulate and control flow of slaughter floor knife sterilisers	1.1	ENV103Pt2
Condenser towers – install pulse output water meters in make-up line	1.2	ENV103Pt2
Monitor and replace worn out hand held hoses in processing area	1.3	ENV103Pt2
Convert to bowl drinkers for 1400 sows	1.4	ENV103Pt2
Reclaimed Water Project – reuse class B water	1.5	ENV103Pt2
New chute to eliminate water use in slaughter floor wax eye chute spray	1.7	ENV103Pt2
Reduce size, insulate and control flow in boning room knife sterilisers	2	ENV103Pt2
Waterless urinals in men’s amenities	2.2	ENV103Pt2
Recycle evaporation water from stick water process	2.78	ENV103Pt2
Replacement spray sterilisers	2.79	ENV103Pt2
High pressure hoses	2.9	ENV103Pt2
Install water meters	3	ENV103Pt2

WATER EFFICIENCY PROJECTS WHERE NO PAYBACK WAS PROVIDED	SOURCE
Flash steam recovery on boiler system	ENV103Pt1
Reduce plant hot water usage – water was available 1 hour before production commenced, with improved management	ENV103Pt1

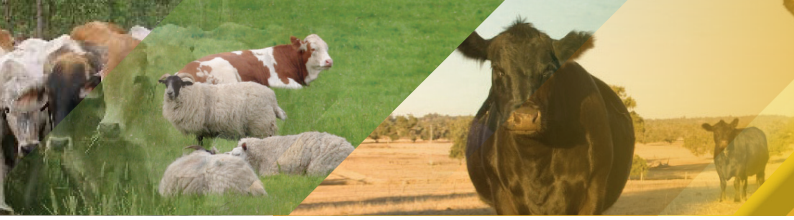


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WATER EFFICIENCY PROJECT WITH INDICATIVE PAYBACKS (EARLIER PUBLICATIONS)	PAYBACK (YRS)	SOURCE¹
Minimise receipt of very dirty stock through contract clauses (section 2.2.3, pg 28)	0	EEMfMP
Dry cleaning manure from yards before washing (section 2.2.6, pg 29)	0	EEMfMP
Use of chlorinated detergents instead of hot water for cleaning viscera tables (section 2.2.12, pg 33)	0	EEMfMP
Improved dry cleaning prior to wash down (section 2.2.30, pg 48)	0	EEMfMP
Rainwater harvesting for cooling water or stockyard washing (section 2.4.1, pg 56)	0.1	EEMfMP
Recover and reuse cooling water	0.26	USDOE
Limiting water use in casing washing by interlocking the operation of the machine to a timer switch (section 2.2.25, pg 44-45)	0.3	EEMfMP
Fit efficient spray nozzles (section 2.2.1, pg 25-26)	0.3	EEMfMP
Flow control of continuous flow sterilisers (section 2.2.14, pg 36-37)	0.3	EEMfMP
Maximise condensate recovery (section 2.2.36, pg 52-53)	0.3	EEMfMP
Centralise control of water supplies, to supervisor can switch off during breaks (section 2.2.2, pg 26-27)	0.4	EEMfMP
Intermittent flow for viscera (bleed) table wash sprays, only when table moves forward (section 2.2.9, pg 31)	0.4	EEMfMP
Setting and maintaining minimum flow rates for viscera (bleed) table wash sprays (section 2.2.10, pg 32)	0.6	EEMfMP
Dry dumping of paunch contents (section 2.2.23, pg 43-44)	0.8	EEMfMP
On/off control of flow (section 2.2.28, pg 46-47)	0.8	EEMfMP
Avoid under-utilisation of spray capacity (section 2.2.4, pg 28)	1	EEMfMP
De-dagging at feedlot to avoid stock washing at domestic plants (section 2.2.5, pg 28-29)	1	EEMfMP
Efficient continuous flow sterilisers (double skinned, water jacket etc) (section 2.2.13, pg 33)	1	EEMfMP
Water sprays on splitting saws to remove bone dust and reduce carcass washing (section 2.2.19, pg 41)	1	EEMfMP
Efficient water use in tripe and bible washing machines (section 2.2.24, pg 44)	1	EEMfMP
Water efficient gut washing systems (immersion washer) (section 2.2.26, pg 45)	1	EEMfMP
Reuse of clean wastewater streams (section 2.3.1, pg 54)	1	EEMfMP
Sensor control of automatic carcass washing (section 2.2.18, pg 39-40)	1.5	EEMfMP
Automatic controls for hand washing (section 2.2.35, pg 51-52)	1.5	EEMfMP
High pressure water ring main for cleaning (section 2.2.31, pg 49)	2	EEMfMP
Automatic washers for tubs, cutting boards and trays (section 2.2.32, pg 50)	2	EEMfMP
Conductivity controlled blowdown on cooling towers (section 2.2.37, pg 53)	2	EEMfMP
Floor cleaning machines for large areas (section 2.2.33, pg 50)	3	EEMfMP
Suspended mesh flooring (sheep + non-feedlot cattle) (section 2.2.8, pg 30)	3.3	EEMfMP
On/off controls for cooling water on breaking saws (section 2.2.20, pg 41)	5	EEMfMP

¹ EEMfMP – Eco-Efficiency Manual for Meat Processing (2002),
 RMPiEEM = Red Meat Processing Industry Energy Efficiency Manual (2007),
 USDOE = US Dept of Energy Industrial technologies Program (74 audits)



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WATER EFFICIENCY PROJECT WITH NO PAYBACKS PROVIDED (EARLIER PUBLICATIONS)	SOURCE²
Timer controls for stock washing (section 2.2.7, pg 29) – prone to tampering?	EEMfMP
Use of warm water instead of hot water (section 2.2.11, pg 32) – hygiene limitations?	EEMfMP
Spray sterilisers for knife or equipment cleaning (section 2.2.14, pg 36-37) – can use same amount of water as well-designed continuous flow steriliser??	EEMfMP
Use efficient wash-down techniques – low cost	MIRINZ
Fix leaking hot water taps and hoses quickly – low cost	MIRINZ
Install sub-metering on electrical and thermal system and link back to SCADA system, to allow development of environmental performance indicators (EPI) relating to electricity and steam/hot water use and tracking over time (section 11.2) – you only manage what you measure	RMPIEEM



² EEMfMP – Eco-Efficiency Manual for Meat Processing (2002),

RMPIEEM = Red Meat Processing Industry Energy Efficiency Manual (2007)