

Trisodium Phosphate

INTERVENTION SUMMARY	
Status	Currently Available
Location	Pre or post slaughter
Intervention type	Surface treatment of hide or warm carcass
Treatment time	10-15 seconds
Regulations	Approved in US, not in EU or Australia
Effectiveness	1 log reduction
Likely Cost	Installation of wash cabinet between A\$500,000 and A\$1 million Ongoing chemical costs not known
Value for money	Not recommended
Plant or process changes	If no wash cabinet already in place, large amounts of space will be required
Environmental issues	Large amounts of water will be used Ecological considerations for effluent disposal Consider recirculating if using as a hide wash
OH&S	The concentrate is corrosive, and toxic fumes may be produced
Advantages	Activity is not affected by subsequent carcass washing
Disadvantages or Limitations	Can cause corrosion of metal

Trisodium Phosphate

Trisodium phosphate (TSP) is an alkaline cleaning agent that has been used as a household cleaner for many years. It works by disrupting the bacterial cell membrane and causing the contents to leak out, though the exact mechanism is not fully elucidated (Oyarzabal, 2005). Trisodium phosphate solutions are approved for treatment of beef carcasses in the US Code of Federal Regulations (21 CFR 182.1778; FDA 2003).

Research has shown that spray-washing with trisodium phosphate (TSP) reduced contamination of beef brisket, and that it may inhibit bacterial attachment, thereby allowing easier bacterial cell removal by washing (Cabedo *et al.* 1996; Gorman *et al.* 1995; 1997).

A 10% TSP solution has also been trialled for use as an antimicrobial treatment applied to beef trimmings before grinding. Microbial reductions were less than 1 log but there was improved colour stability of ground beef (Pohlman *et al.* 2002). Dickson *et al.* (1994) applied 8-12% TSP solutions at 55°C to artificially contaminated meat pieces and recorded reductions of *Salmonella* Typhimurium, *Listeria monocytogenes*, and *E. coli* O157:H7 ranging from 0.8-1.2 log.

Disposal of TSP in effluent is an environmental consideration as it will aggravate eutrophication in ponds and lakes. Eutrophication is the development of excess organic material, e.g. algae blooms, following nutrient (nitrogen or phosphorus) overload. Recycle wherever possible. Consult manufacturer for recycling options.

Proponent/Supplier Information

EcoLab Australia

6 Hudson Avenue

Castle Hill 2154 NSW

Ph: 61-2-9680-5444

Website: <http://www.ecolab.com>

References

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Oyarzabal, O. (2005) Reduction of *Campylobacter* spp. by commercial antimicrobials applied during the processing of broiler chickens: a review from the United States perspective. Journal of Food Protection, **68**: 1752-1760.

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