Project overview

MEAT & LIVESTOCK AUSTRALIA

Clean Technology for Tanning Processes at Abattoirs

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Executive summary

Background

A major cost in either establishing new tanneries and fellmongeries or expanding existing plants is the capital and running cost of effluent treatment due to the imposition of stringent regulations and increased charges.

The objective of this investment was to adapt the Sirolime hair-saving process for use in fellmongeries, to completely reuse the salts, including chromium salts, used in pickling and tanning to significantly reduce effluent volumes and loads.

Achievements

A total chrome liquor recycle (TCLR) system was developed, pilot scale trials successfully completed and good quality leathers were produced. Flash evaporation was shown to be the most cost-effective method of concentration and a liquor treatment system was developed. The system enables all the salts remaining in pickling and tanning liquors to be recycled. This significantly lowers the levels of chromium, sodium, chloride and sulfate ions in the effluent. The Cost Benefit Analysis of the Total Chrome Recycling Process shows that the analysis is favourable for tanneries where there are high effluent disposal costs, especially for Total Oxidised Sulphur (TOS) or where salinity or Total Dissolved Solids (TDS) is a problem. The capital costs of the process are high and the payback period depends on the particular effluent disposal costs and the existing system used to treat chrome liquors.

The cost benefit analysis showed that for some tanneries the evaporation system would not be beneficial. For some of these tanneries it would be of greater economic benefit to achieve total chrome use by precipitating chromium from excess liquors. This is known technology, but trials were carried out to determine requirements for the use of Australian magnesium oxide products and the recommendations have been reported. This system does not reuse the sodium chloride or sulfate in the excess liquors.

A novel possibility for a simpler and more cost-effective system to reuse the chromium and part of the sodium chloride and sodium sulfate in excess liquors is at present being investigated. Such a system would normally be expected to be detrimental to leather quality. Initial experiments have given encouraging results and matched-side trials are being conducted to ensure that finished leather quality is not compromised.