LAIRAGE CLEANLINESS

The cleanliness of the lairage environment is important in the maintenance of coat cleanliness. Grau and Smith (1974) found that sheep fleeces became contaminated with salmonellae within one day of entering contaminated animal pens, and this contamination increased with the length of time spent in the lairage and with the degree to which the pen floors were contaminated. In the first two days of lairaging, only a few sheep excreted *Salmonella* in the faeces, but there was a rapid increase in the numbers excreting *Salmonella* after 2-3 days. Lambs carrying less contamination on their fleeces will decrease the level of contamination brought into the abattoir environment but wet pens can increase the microbial load on sheep fleeces (Duffy *et al.*, 2000).

Large numbers of Gram negative and Gram positive organisms have been found in cattle lairages, including contamination of the air and water (Patterson and Gibbs, 1978), and the normal cleaning and disinfection procedures in lairages have been found to be insufficient to remove environmental contamination with *Salmonella* spp. (Swanenburg *et al.*, 2001) and other food-borne pathogens (Small *et al.*, 2002). Fresh cattle faeces are reported to contain an aerobic plate count of 6-7 log cfu/g (Bell 1997), and an adult bovine can void up to 25.5 kg of dung and 12-22 litres of urine in 24 hours (McGrath and Patterson, 1969). Therefore, if there is insufficient bedding or drainage in animal accommodation, or poor lairage design or maintenance, faecal soiling of the hide can occur (Gregory, 1994). A link between hide microbial contamination and subsequent carcass contamination has been reported (Arthur *et al*., 2007). It has been suggested that if hide contamination itself can be controlled, the contamination of carcasses can be controlled. Several studies have also concluded that the lairage environment is more significant than the originating feed lot or farm, when determining the origin of *E. coli* O157:H7 contamination on cattle hides (Avery *et al*., 2002; Arthur *et al*., 2008: and Mather *et al*., 2008). Conversely, Fegan *et al*. (2009) concluded that hides were more likely to be contaminated with *E. coli* O157 at the feedlot than at the abattoir, although they found high prevalence of this organism in the lairage pens at the abattoir (47% of samples taken from the pen rails and 42% of samples taken from the pen floor).

Adam *et al*. (2010) suggested that animals from farms that implement good agricultural practices (GAP, Horchner *et al*., 2006), and have, as a result, low prevalence of pathogens such as *E. coli* O157 or *Salmonella*, should be kept separate during transport and lairage from other animals to prevent cross contamination. It is often the practice within Australian abattoirs to either reject animals that are delivered to an abattoir in an 'exceptionally dirty' state, or they can be separated and held for treatment before they are processed. These 'higher risk' animals are then processed at the end of the day prior to cleaning.

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