Food Refrigeration & Process Engineering Research Centre

THE GRIMSBY INSTITUTE of Further & Higher Education

FSA Project M01028:

Cleaning and disinfection of lairage-to-stunning areas in abattoirs

Duration

1st January 2004 – 31st January 2006

Project Partners:

Division of Food Animal Science (DFAS), University of Bristol

Food Refrigeration and Process Engineering Research Centre (FRPERC), University of Bristol

ADAS Consulting Ltd

Background

This project aimed to assess the status of hygiene and cleaning effectiveness in UK abattoirs and to identify best practices for cleaning/disinfection of lairage-to-stunning areas. Abattoir layouts, practices and cleaning procedures were evaluated using a questionnaire and visits. Experimental studies were then conducted to evaluate the efficacy of different cleaning/disinfection regimes.

Research Summary

Results of the abattoir survey showed that cleaning practices and the types of cleaning agents used varied considerably in commercial abattoirs. On the whole, holding pens were washed out on a daily basis, and the race and stun-box-roll-out area on each break. Chemical agents tended to be used daily in the stun-box-roll-out areas and weekly in the race and holding pens, if they were used at all.

Microbiological examination of five commercial abattoir lairages found that routine cleaning practices did not entirely remove microbiological contamination, with up to 2.8 log10 cfu cm-2 E. coli remaining at some sampling sites. As a result, there is a potential risk of foodborne pathogens persisting in the environment and potentially contaminating animals and carcasses processed on subsequent days.

During experimental cleaning studies, concrete tiles were artificially contaminated with field strains of E. coli and Salmonella Kedougou, with and without the presence of faecal matter. When no faecal matter was present, the use of a proprietary sanitiser at maximum recommended concentration, or the application of steam under pressure gave greater reductions in microbial contamination than the use of mains or a pressure wash. Where the surface was visually contaminated with faeces, the use of a pressure wash followed by immediate steam application gave reductions in microbial contamination comparable with the use of a proprietary sanitiser at maximum recommended concentration.

The use of steam alone on a visually dirty surface was not an effective means of reducing microbial contamination.

A small pilot trial carried out under commercial conditions found that pressure washing followed immediately by steam application was the best method of cleaning a holding pen floor, followed by use of a sanitising agent at the greatest concentration recommended by the manufacturer.

Research Implications

The study showed that microbial contamination often remains in UK lairage holding pens after routine cleaning operations . It would appear that there are significant differences in the effectiveness of lairage cleaning programmes at commercial abattoirs, and that the stun-box-roll-out areas are often cleaned to a better standard than the holding areas. As a result, there is a possible risk of foodborne pathogens persisting in the environment and potentially contaminating animals and carcasses processed in subsequent days. Slaughterhouse operators should take steps to reduce the level of contamination both in their premises and on their carcasses.

The results of this work provide the FSA with a scientific base to derive best practice information for the meat industry, which will ultimately contribute to improved meat safety.

Some Publications from this Project

Presence of Salmonella spp. in the red meat abattoir lairage after routine cleansing and disinfection, and on carcasses.

Small A., James C., James S., Davies R., Liebana, E., Howell M., Hutchison M. & Buncic S. (2006). Journal of Food Protection 69 (10), 2342-2351. [FRPERC Biblio Ref: 862]

An evaluation of simple cleaning methods that may be used in red meat abattoir lairages.

Small A., James C., Purnell G., Losito P., James S. & Buncic S. (2007). Meat Science 75, 220228 . [FRPERC Biblio Ref: 865]

Construction, management and cleanliness of red meat abattoir lairages in the UK.

Small A., James C., James S., Davies R., Howell M., Hutchison M. & Buncic S. (2007). Meat Science 75, 523-532 . [FRPERC Biblio Ref: 871]

Efficacy of simple methods of cleaning for red meat abattoir lairages.

Small A., James C., Purnell G., Losito P., James S. & Buncic S. (2006). 52nd International Congress of Meat Science and Technology, Dublin, Ireland, 13th-18th August, 353-354. [FRPERC Biblio Ref: 848]

Serotypes and antimicrobial resistance of salmonella enterica on red meat carcasses and in the lairages after cleaning, in the Southwest of England.

Small A., James C., Purnell G., James S., Davies R., Howell M., Hutchison M. & Buncic S. (2006). 52nd International Congress of Meat Science and Technology, Dublin, Ireland, 13th-18th August, 341-342. [FRPERC Biblio Ref: 849]

Routes of salmonellae contamination in pig lairages and- the development and evaluation of simple cleaning methods.

Small A., Purnell G., James S. J., Howell M. & James C. (2007). 7th International Symposium on the epidemiology & control of foodborne pathogens in pork, Verona, Italy, 9-11 May 2007. [FRPERC Biblio Ref: 885]

Contacts

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