ADVANCED TECHNOLOGIES IN THE MEAT INDUSTRY

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INTRODUCTION:

Mechanisation and automation of animal stunning, slaughter, dressing and boning operations can offer many benefits, including improved process hygiene through reduced hand/hide cross contamination, better hide/pelt quality, better quality of the deboned product, increased meat yield, improved worker safety and reduced labour costs. The degree to which these operations have become mechanised or automated varies, depending on the species of animal.

LAMB PROCESSING

INTRODUCTION:

As a major producer of sheepmeat for export, the New Zealand meat industry has over the last decade invested heavily in the development of slaughter, dressing and boning equipment for sheep and lambs. This equipment was developed with inputs from meat processing companies, farmer producer boards, government research agencies, commercial engineering companies and the Meat Industry Research Institute of New Zealand (MIRINZ). The programme was initiated in response to increased labour costs, the need to meet more stringent hygiene regulations that had decreased slaughter and dressing productivity, the need for consistent size, shape and high product quality and furthermore, the need to be competitive on the world markets.

SLAUGHTER AND DRESSING OF SHEEP:

Seven machines have been developed for use with a mechanised inverted dressing system for the slaughter and dressing of sheep. The configuration of these machines in an inverted dressing system is shown in Figure 1.

Stunning:

Two types of electrical stunning, the preferred method for sheep have been developed, namely head-only and head-to-body. Head-only stunning which meets halal slaughter requirements, results in an initially still animal that starts to produce a paddling or running movement even after the throat has been cut. Such movement can be reduced by passing an electric current through the carcass preferably by using rubbing electrodes after shackling. A head-to-body stun results in cardiac arrest and the current through the body reduced subsequent movement. Both types of stunning have been easily adapted for automation. All automatic sheep stunners developed to date have used a "V" restrainer system for controlling the location of the animal throughout the operation. The first automatic stunner for sheep and lambs evolved from a unit developed in Europe for pigs. This unit was then modified for sheep by New Zealand researchers. MIRINZ developed an automatic stunner that used a single "V" restrainer. With this system each sheep is brought to a position where its head is adjacent to two grids of nozzle electrodes. Once the animal is in place, the two grids move inwards until they contact each side of the animal's head. The nozzle electrodes then simultaneously administer electrical current to the head and emit water which assist passage of current. The design of this stunning system was improved by New Zealand's Alliance Freezing Company to cope with horned stock. This improved stunning system uses a dual "V" restrainer system in which one conveyer feeds the other. The use of two conveyers allows controlled spacing of the animals. The success rate of the machine was also improved by minor changes to the way the grids of electrodes