final report

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Installation of a Sternum Hook

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Report
on the
Installation

of a

Sternum Hook

at
V&V Walsh
Bunbury

by

SFK Australia

09 June 2002

SUMMARY

The sternum hook is a simple, inexpensive alternative to the use of electric back-stiffening probes during downward hide pulling.

Meat & Livestock Australia own the Intellectual Property in Australia for this system, but this is unlikely to be patentable because of the simplicity of the system, and prior disclosure.

However, an opportunity exists for SFK to market a kit to abattoirs, with MLA approval, because SFK knows the construction details and has experience with the system.

1. INTRODUCTION

Downward hide pulling can break the backbone of a carcase unless electrical stiffening is used. However, this is expensive, results are variable, and it can be dangerous.

The sternum hook is a large stainless steel hook which is inserted into the thoracic stick wound, behind the sternum, and which supports the carcase during downward hide pulling.

2. CONSTRUCTION

The sternum hook is made of 25mm diameter stainless steel. Details and a template for medium size cattle are attached. The hook is attached to a length of stainless steel proof (certified) chain (1600 kg safe working load) using certified lifting shackles (see attached sketch). The chain link dimensions are 65 x 43 outside, and the material is 13mm diameter. The length of the chain depends on the mounting position, but ideally should not be less than 2m, so that only the chain (not the cylinder rod) comes in contact with the carcase.

The upper end of the chain is attached to a hydraulic cylinder: 38mm bore x 1500mm stroke x 22mm rod diameter. The cylinder is flexibly attached (for example, by chain) to beams above the rail. The position of attachment should be so that the hook hangs vertically-down in the correct position for insertion into the carcase.

Comment: The stroke of the ram depends on (a) the movement required to insert the hook (about 300mm), **plus** (b) the variation (range) in height of the sternum from the smallest to the largest carcase.

The hydraulic system is a dedicated powerpack in which the operating pressure valve is set **very** low, so that the upwards lift on the hook cannot exceed 60-100kg. The required pressure is outside the range of most hydraulic powerpacks, thus the sternum hook cannot be operated by existing in-plant hydraulic systems. There is also an additional pressure regulating valve which operates to relieve any extreme pressure in the hydraulic lines when the normal valves are all closed. This valve is installed only for safety reasons (see sketch). The motor operates intermittently, only when the operator raises or lowers the hook.

Comment: the powerpack at Walshes is 4kW, because this is a standard configuration. 2kW is sufficient, but there was no cost saving in changing the motor.

3. OPERATION

The carcase is moved into position at the hide-pulling station. The operator lowers the hook using the electrical pendant (see sketch), inserts the end of the hook behind the sternum and raises the hook. Because the hydraulic pressure is preset, the hook lifts only to the preset load – usually around 60kg. This is virtually fool-proof.

When the operator releases the UP button, the hydraulic valves are all closed, and hide-pulling can begin. The "induced" downward load on the hook during pulling has been measured up to 750kg, and the system is designed to allow up to 1500kg.

After hide-pulling is completed, the operator lowers the hook out of the carcase, and places the hook and chain in a steriliser, ready for the next carcase.

Comment: the steriliser at V& V Walsh was constructed by Walshes, and is a large tub of hot water. This requires that the hook and chain are lowered into the tub, and this is unnecessarily slow. It would be better to have a vertical steriliser with spray jets, similar to an apron wash.

4. RESULTS

V& V Walsh are using the sternum hook continuously and report that backbone breaks are reduced. They also noted that the "preload" is around 60kg, and that this setting is critical – too much, or too little will cause an increase in back breakages. Comment: this preload may also need to be varied for larger or smaller cattle.

5. MARKETING

MLA plans to publicise this system as part of their normal publications process. They will probably include construction and operation details. This will allow any competent Plant Engineer to construct the system. However, it is expected that many plants would prefer to buy such a system "off-the-shelf", and an opportunity exists for SFK. Ideally, the MLA publication would include a comment such as: "Complete kits are available from SFK Australia"