

Hide Shredding for the Rendering Plant

Shredding Hides to render as an alternative to
Tanning them.

Australian Meat Group

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Prepared by
Allister Watson, Pasadena Partners Ltd

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1.0 Executive Summary

The main objectives of this project have been met by AMG.

The project has been delivered on time and on budget. The 2 shredders were installed at AMG Dandenong in May 2021 along with the belt conveyors and the screw conveyor.

Almost as soon as the shredders were installed, the price for Hides rose above the breakeven price to render them so no full hides have been processed through the shredders apart from those put through in commissioning.

Whilst no full hides have been processed, all damaged hides as well as headpieces, belly strips and off cuts from the socks are being processed on a daily basis. These products were never rendered in the past as they were too big to go straight to the rendering plant.

The return for the pieces has gone from \$1.50 per animal up to \$6.00 per animal depending on the price for Tallow and MBM. This has meant there is an acceptable payback on the equipment without whole hides having to be processed.

The average monthly maintenance cost for the machinery is \$500 month, however the large Brentwood NZ60 shredder has had \$87,000 spent on doing the bearings, motor and a full overhaul in the past 3½ years. Over the same period the smaller Brentwood NZ15 shredder has had \$16,600 on it with a gearbox rebuild and a full overhaul.

This has been a very successful project for AMG and AMPC and could easily be adopted by other red meat processors to extract more value from the animal.

2.0 Introduction

This project is the result of hide returns in 2020 being much lower than previously seen from sending them to tanners which has traditionally been the process. Work was done at AMG to establish if they could go to the rendering plant instead and if so, what impact would they have on the process and the returns from this plant.

There was no information available for AMG to reference against, but their own findings established that a hide from the cattle they typically slaughter would return between \$20 - \$25 each when the market price through tanneries was then at \$6 - \$8 each.

The concern was to get the hides through the rendering plant grinders without clogging them up. It was established through trials that the optimum size of hide material was 16 -20mm long. In order to get the hide down to this level it would require an initial Heavy-Duty Shredder and then a Lighter secondary shredder to break the pieces smaller.

There was sufficient capacity in the rendering plant to take the approximately 4000 hides per week and up to 5500 per week at the peak of the season.

3.0 Project Objectives

This project is to establish more value from the beef hides by shredding them to a level that they can go through the rendering plant and not cause any blockages and plant breakdowns. This has come about due to the poor prices received for beef hides in 2020/21 and the need to have a viable alternative when prices are low. The hide itself has a high protein content and is ideal to add value to the rendering already taking place, however, it must be shredded in a cost-effective manner first in order to go through the system.

The project should give AMG a system that they can implement when required to shred and render hides when the returns are greater for doing this rather than selling them to tanners. The shredding equipment needs to be robust enough to handle up to 1000 hides per day and the grinders in the rendering plant must be capable of taking that amount of extra volume through it.

The hide itself is a great protein source and will improve the protein levels in the current rendered product, however, it is bulky and needs to be shredded to a manageable size for the AMG team to handle and the plant to process it otherwise it will cause blockages and stop the plant.

The recent level of hide return from the tanners have been between \$6 - \$10 per hide where in the past they have been as high as \$80 per hide. The return from rendering the hide is estimated to be \$20 - \$25 per hide. With an overall project cost estimate of \$550,000 and processing 4000 hides per week on average the payback for this project will be just over 3 months. It is not envisaged that the low prices for hides will continue, however, this gives both AMG and the red meat processing sector a viable alternative when they are low. This return on the hides ultimately reflects on the livestock price paid to the producers.

4.0 Methodology

This project will involve:

- Identifying the requirement to shred and render up to 1000 hides per day.
- Identifying the equipment needed to transfer the hides from the slaughter floor to the rendering plant, the shredders required to process 1000 hides per day into manageable pieces and the area required to do all this in.
- Measuring the rendering results without the hides included and then with the hides in, to determine the value the hides are adding to the rendering results.
- Determining the overall costs and returns of the operation to determine when it is the right time to shred the hides rather than sell them

5.0 Project Outcomes

AMG started this project in 2021 when the global hide price had dropped significantly after the Covid pandemic reduced demand significantly for leather goods and in particular from car manufacturers.

It has always been known that the hide contained protein that could be converted to MBM and fat that could be rendered to tallow. The values were calculated by AGM as shown in the chart in the appendix and with the hide returns below that it was determined that shredding the hides and rendering them was a better option.

Shredders had been tried in the industry in the past without much success however the AMG team determined that 2 shredders were needed to break the hide down small enough to render efficiently.

A large Brentwood NZ60 shredder was used first and then a smaller Brentwood NZ15 to break the pieces down even smaller. An opening was made through the slaughterhouse wall where a conveyor took the hide outside to a table to be trimmed and then fed to the larger shredder. From here the large pieces were moved by a conveyor belt to the smaller shredder and then via a screw conveyor to re-join the main rendering conveyor from the slaughter floor.

The design was crucial as when the hide price rose above the return from rendering, the hide was trimmed and the headpiece, sock pieces and belly pieces went to rendering and the hide was put in a bin to go to the tanneries.

The cost of the equipment was in line with the initial project costs. The shredders cost approx. \$225,000 initially, the belt conveyors cost approx. \$40,000, and the screw conveyors approx. \$20,000. There was a further \$90,000 spent on site works, electrical works and controls, as well as a significant amount of work done by the AMG engineers.

Early in the start up the large NZ 60 shredder had to be rebuilt as it blew up due to the pressure. An auto reverse gear was included to ensure the shredder reversed when the pressure built up too much thus protecting the shredder itself.

As the hide price began to rise the calculated return from just the head pieces, belly strips, and socks was initially \$1.50 per hide then \$2.00 which made the payback for the project 1.5 years on rendering these pieces alone. Recent rendering prices have lifted the return for just these off cuts to as much as \$6.00 per hide.

The hide price has never dropped low enough for the full hides to be shredded however this is a good option for the hide off cuts as mentioned above and any damaged hides from the slaughter floor.

Regular maintenance has been at a cost of approx. \$500 per month, however the NZ60 had both the bearings and motor overhauled in 2022 at a cost of \$13,500 and then had a complete rebuild in 2024 at a cost of \$73,500. The NZ15 shredder had a gearbox overhauled in 2022 at a cost of \$3,000 and a full rebuild in 2024 at a cost of \$13,600.

6.0 Discussion

This project has shown that when a normal market for hides (or any raw material) does not give you the returns that you expect or have had in the past, then you need to look at alternative ways to get a return.

Processors have known for a long time that there is fat and protein value in hides that they could extract from rendering them but they hadn't thought through how to do that efficiently and consistently up to now.

AMG worked out that there needed to be 2 shredders and the shredded hide pieces needed to be fed back into the rendering screw consistently to mix with other material rather than in one large dump bin.

By sorting through this process they found an alternative not just for full hides when the market dropped but, they could extract value from the pieces of the hide the tanneries didn't want – head pieces, belly pieces and some socks.

7.0 Conclusions / Recommendations

This has been a good project for AMG, AMPC, and other red meat processors as it clearly shows that you can extract more value from the animals you process if you think about how to process them differently.

The extra revenue that AMG is creating from the headpieces and other off cuts from the hides more than pays for the investment in machinery and process that has taken place.

AMPC should use this model as an example for other processors to follow in looking for value in doing things in a different way. They should also encourage other processors to copy this project and invest in shredders so they can extract more value from the animals they are currently processing.

8.0 Appendices

	\$/MT	Weight	Yield		Total Per Hide
			Tallow	MBM	
			%	%	
Processing Cost	\$ 70		11%	40%	\$ 3.50
Hides (Kg)		50	5.5	20	
Returns (\$/MT)			900	650	
Returns (\$/Hide)			\$ 4.95	\$ 13.00	\$ 17.95
Net Returns					\$ 14.45