Individual Hide, Skin and Split Traceability

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Sustainability vs Traceability

Traceability: Visible or other sign of what has existed or happened

Sustainability: The ability to continue a defined behaviour indefinitely

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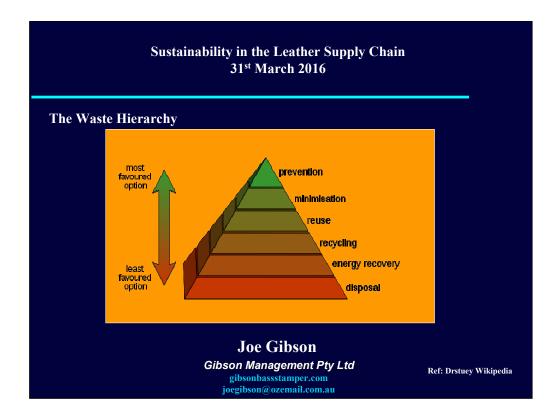
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When I was asked if I would deliver a discussion on hide, skin and split traceability at this Hong Kong seminar of course I said yes immediately. I am happy to go anywhere to talk about traceability. It is something I have had a passion for over many years. So much so that about 10 years ago a colleague and I developed a machine to provide traceability in the leather industry, called the Gibson Bass Stamper, but I will talk about that later.

While thinking about this invitation, it occurred to me that I was being invited to speak at a Sustainability seminar, and I asked my self the question, that you may well also ask yourselves – What does Traceability have to do with Sustainability?

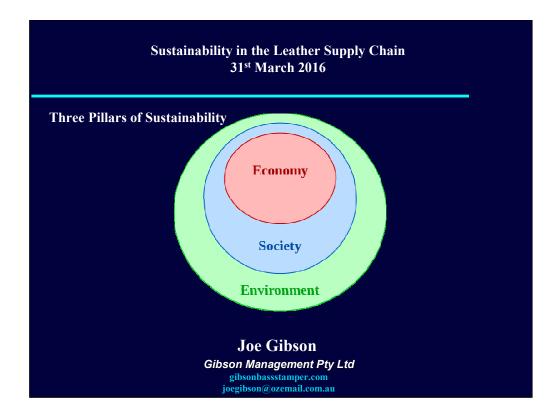
Traceability is, according to the Oxford English Dictionary, "visible or other sign of what has existed or happened". On the other hand, Sustainability has been defined as "the ability to continue a defined behaviour indefinitely". What is the connection?

I thought I would pursue this question to see where it led.



In looking at Sustainability further I came across the following, analysing options for coping with waste when trying to achieve Sustainability, the so called Waste Hierarchy.

So it seems that the best option for achieving Sustainability is for prevention of waste. Of course I was aware of this through, among other things, the work that Catherine Money pioneered in Australia on waste recycling, reuse, minimisation and prevention over the last 3 decades or more. Indeed a tannery I was managing was the first anywhere in the world, as far as I know, to use chrome liquor recycling, sometime in the mid 1980s.



I also came across the so called Three Pillars of Sustainability

I was also aware of this concept through the development of the Triple Bottom Line accounting theory. The conundrum for me was to link these to traceability. The challenge was to find how prevention of economic waste, societal waste and environmental waste could be enhanced by having individual traceability of hides skins and splits in the leather industry.

To achieve traceability, we need to have the "Ideal" hide, skin and split identification system.

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To make a proper analysis I thought I would go back to some work I did with colleagues in the past, when we decided to brainstorm the "Ideal Identification System". After all if we are to consider the link between Sustainability and Traceability and get the optimum benefit, we need to start with an ideal system of identification.

The Ideal Identification System

- ☐ Hygienic, safe, for application in a kill floor or tannery
- ☐ Can be applied while the hide is still on the animal
- ☐ Human Readable / Human Decodable
- Application device connected to the internet
- □ Code can be externally generated
- Selectable number of digits eg 4, 5, 6, 7
- ☐ Lasts through to finished leather
- 100% Retrieval
- Readable with hair on and hair off
- **■** Machine Readable
- ☐ Unique code on each piece
- ☐ Applied and readable on the grain and the drop

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This is a very comprehensive list, and I might add it is a difficult one to achieve. However for the sake of the exercise, let's assume we have an identification system which can deliver all of these things, and see if we can, even if only remotely, link it in some way to an increase in Sustainability

How can Traceability prevent waste?

- **■** Efficiency in Stock Control
- Make contract tanning hides more efficient
- **■** Settle/Avoid Claims
- ☐ Can be used as a tool for hide improvement

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How can Traceability prevent waste?

One simple thing which came to mind impinges on Economic waste. Let's assume we have for example a wet blue plant which has an individual hide identification system like the one we looked at, in place. Anyone who has taken part in a stocktake knows the amount of time it takes. Stock taking is an essential part of running a business, to work out how much profit you are making, or even whether or not you are making a profit. (I have not yet heard of a tanner who made a profit, but I assume they exist.) But stocktake in a tannery is an accountant's nightmare. I can't think of any other industry in the world that has an SKU (stockkeeping unit) of the value of a hide, skin or split, that does not have it individually identified and its location recorded.

With an efficient modern individual identification system you can not only know exactly how many pieces are in each drum, but which ones they are. The benefits of this to the economic efficiency of the tannery are considerable.

I thought that I might be onto something here, so I continued my search for economic efficiencies (ie prevention of waste ie sustainability) in the tannery that can be brought about by an individual identification traceability system.

The second area I looked at was contract tanning. Now not everyone does contract processing, but a surprising number of our Gibson Bass stamper customers do. Keeping different supplier's material separate in a tannery can be a real problem. It can result in sending drums away half empty, which is a huge waste of resources, in terms not only of labour and perhaps material, but also in terms of drum capacity. Those contract tanners I know who have had individual identification, and therefore been able to fill drums and accurately separate their commission hides from their own hides, have prevented an enormous amount of waste.

What convinced me I was on the right track here was when I started thinking about claims. I had a phone call from a customer a little while ago who said he had a contact from an Italian user of their product, who said they had received one pallet of a shipment of pallets which had no individual identification of the hides. All the other pallets had the hides clearly individually identified as always, but this particular pallet had none. The customer asked if the ID system had been out of action, but was very quickly advised that the real hides must have been substituted, and the unmarked ones obviously came from somewhere else. Now as it happened, the authentic hides were really top class New Zealand hides. I think I can safely assume that as a result of a deliberate or perhaps an accidental switch, someone had got hold of a pallet of beautiful hides that they should not have had. Without individual identification this would never have been found out.

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And if you have ever received a claim, and you don't have to go through too many price cycles to receive one, how did you know that the articles in question were indeed yours. How much money has been wasted over the years on false claims that could not be rejected because there was no clear evidence of where the product came from?

And importantly, even if a claim is valid, the presence of individual identification is a huge benefit in terms of dealing with the claim. It gives confidence to both sides to negotiate from a position of certainty, rather than doubt and mistrust.

How can Traceability prevent waste?

Dr. Gerhard Wolf of BASF:

"Raw stock is the single most important and valuable resource in the production of leather. Every attempt to increase the added value by upgrading low-quality leather brings immediate benefits" to leather's resource footprint. True sustainability demands prevention of waste; and the leather industry's greatest area of waste is hide and skin damage.

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I read a quote by Dr. Gerhard Wolf of BASF, speaking about sustainability:

"Raw stock is the single most important and valuable resource in the production of leather. Every attempt to increase the added value by upgrading low-quality leather brings immediate benefits" to leather's resource footprint.

In other words, any attempt to improve hide and skin quality eliminates waste. True sustainability demands elimination of waste; and the leather industry's greatest area of waste is hide and skin damage. It made me think of the potential for improving the quality of hides and skins, and also less directly splits, by feedback of information. This of course can only be achieved when there is an individual hide skin and split identification system in place.

I am sure everyone is aware of the "double whammy" effect of poor quality hides and skins. They cost more to process because you have to try to disguise the problems, but they sell for less. And often the yield is less as well. This is a massive economic cost to the industry, and as such a real barrier to true sustainability.

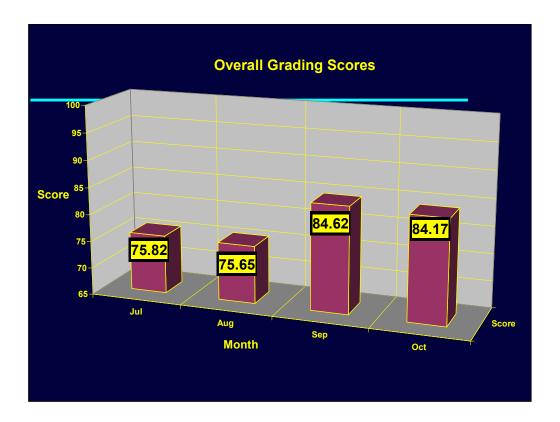
Every farmer I have spoken to always thinks their hides and skins are the best, and of course when you look closely, you often find they are not; however nearly every farmer I have spoken to when faced with the reality of the quality of their hides or skins, is keen to do something about the hide or skin quality, especially if they get some reward for it.

What I can say is, if you have individual identification, and can trace back that hide, skin or split to the farmer or the meatworks, you have a potentially very powerful database of knowledge that can be used to make things more efficient, and hence more sustainable. For example let me explain some work done in Australia in this area.

Some Examples of real data

Taken from one alliance over 4 months

I have some real data from one of the supply chains we developed.



As a bit of background, we developed a quantitative objective grading system for evaluating hides. Without going into this in detail, it allowed us to, quite accurately, give hides a score out of 100. When we identified the hides at the meatworks, and were able to grade them at the tannery and trace them back to their source we found a lot of astounding information that I had not before dreamed existed.

Over 4 months the tannery was aware of hide quality variations, but now we were able to actually quantify them.

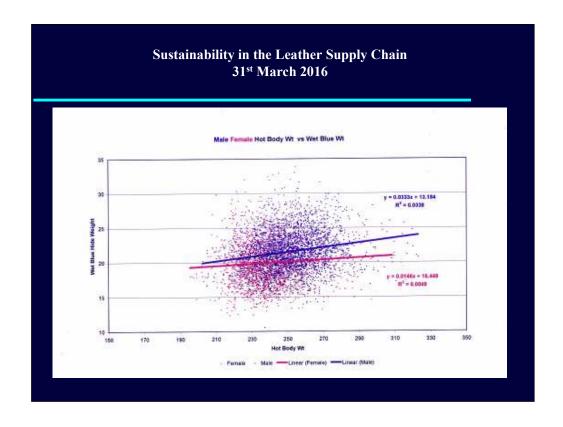
	The V	Vorst		
•	Supplier 1	31/8 Lot 4008	24 hides	
	Brands	Scratches	Parasites	Score
	4.8	1.9	4.9	59.9
•	Supplier 2	1/8 Lot 5019	37 hides	
	Brands	Scratches	Parasites	Score
	5.0	2.2	4.5	62.3
•	Supplier 3	25/8 Lot 1012	25 hides	
	Brands	Scratches	Parasites	Score
	4.9	2.6	4.2	64.2

We were able to clearly identify the worst hides, and where they came from. Some of these were dreadful, but when they are mixed in with a couple of thousand other hides they do not stand out, but when they are individually identified and traced back a clear picture emerges.

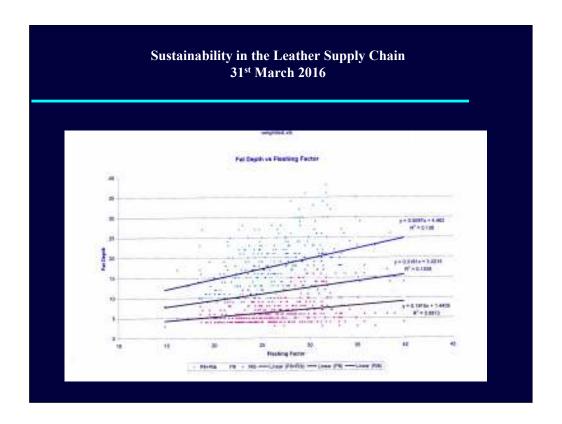
The Best								
Feedlot 1	11 Deliver	ries 2/7/	7/XX - 16/9/XX					
Brands	Scratches	Parasites	Score					
5.0	3.5	4.7	79.5					
5.0	4.5	5.0	93.2					
5.0	4.3	4.8	94.5					
5.0	3.7	4.9	82.7					
5.0	3.8	4.9	84.0					
5.0	3.7	4.8	81.7					
5.0	4.0	4.9	86.7					
5.0	4.3	5.0	91.4					
5.0	3.8	4.9	84.7					
5.0	4.7	5.0	95.8					
5.0	4.9	4.4	95.1					

We were also able to identify the best hides. This particular feedlot produced consistently wonderful hides. Much better that the average. It was like a goldmine for the tannery, but they had never known it before. Having this sort of knowledge allows the innovative operator to make all sorts of decisions that cannot even be contemplated without individual identification.

Just to give you a brief idea of some of the data analysis that you have access to if you have individual traceability back to the body. You can analyse the data by sex, by breed, by live fat measurements, by season, by region etc etc. Traditionally hides have been just a lottery. We know there is variation, and we know that it costs us money, but that has been all we know. With individual identification and traceability we can analyse the source of that variation, and take action to minimise or prevent it.



In one network I worked with, the hides were paid for based on the hot body weight of the cattle. While there was a correlation between the hot body weight and the eventual wet blue hide weight, it was quite different from the one being used for calculation of the price, as well as being quite different for male and female cattle



fleshing factor" - the weight of fleshings as a percentage of the hot body weight. The participants in this network were basing their transactions on a flawed assumption about how the hot body weight of the animal compared to the eventual wet blue weight of the hide, rather than on the facts. Information about the correlation of the fat depth at the two measured sites (P8 and Rib) and the knowledge that could be drawn from it would have had a major effect on the monetary transactions in this case.

What can Traceability Achieve?

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- **☐** Settle/Avoid Claims
- ☐ Can be used as a tool for hide improvement
- **□** Prove Provenance
- Allow implementation of Social Safeguards

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I could talk for a couple of hours on this subject, but suffice to say, I had satisfied myself that individual identification and feedback has perhaps the greatest potential to increase sustainability (ie prevention of waste) in the leather industry.

So having convinced myself of the link between traceability and the first of the three pillars, the economic efficiency, I then started to think about whether Societal and Environmental waste could be prevented by individual traceability.

I must admit that several years ago I would have struggled to draw a link between traceability and societal and environmental waste. There is no problem with many aspects of the tanning industry in identifying preventable waste in these areas, but how does Traceability work to prevent this waste? Well the work that has been done by the Brands and through the Leather Working Group certainly has changed my thinking on this.

As has been shown by the LWG, traceability is one of the key weapons in being able to prove that a leather supply chain is environmentally and socially responsible. The giant leaps made in rewarding those supply chains that put in place systems to ensure no leather comes through them unless the societal and environmental responsibility is documented and proven have been immense.

As pointed out above, the micro aspects associated with economic efficiencies and prevention of waste, such as in stock control improvements, enabling efficient commission processing, avoiding or handling claims and building relationships along the supply chain to improve hide quality are important, and can and should be done by individual firms acting alone. The macro effects of the industry on society and the environment can not easily be met by individual companies. The framework provided by the LWG's third party auditing of waste prevention in the leather supply chain is a crucial element in achieving this.

Which brings me to the subject of split identification. There are many gold members who have in place an identification system, which is not based on individual identification, but which does, in part, link their products back to the origin. They may be able to say that they know where the hides did not come from, but cannot truly trace the origin back to the individual body or the individual farm. These batch or paper based identification systems provide a form of provenance, but I would argue at a level which nowhere near approaches what is needed for preventing waste, ie for achieving sustainability. They do however preclude achieving many of the other economic benefits I have talked about that individual identification brings. But the main problem with these batch based systems is that they exclude a large part of the industry from attaining true sustainability, and that is those tanners who process splits.

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The LWG protocol states "Splits are not thought capable of being subject to physical identification and it is therefore anticipated that Grade B is the highest grading achievable by organisations working with splits."

Of course if there was an Ideal Identification system available, such as I described earlier, where the individual identification was applied on the grain and the drop, this caveat, this enduring relegation of split tanners to B Graders in the eyes of customers, could be overcome, and they could at last achieve Gold. If there were a system that allowed individual identification of both the drop and the grain at the same time, then the industry could get the full impact they are after in creating sustainability, rather than settling for something which, while it holds sustainability as a lofty goal, admits that it is unachievable.



So let's return to my Ideal Identification system and see if it is achievable. To help with that, firstly let me describe the Gibson Bass Stamper to you. It is a computer controlled stamping system which stamps individual letters, numbers or codes onto a hide or skin or split at virtually any stage of the tanning process, but is most useful if applied on the kill floor, at the abattoir, or at the tannery before or after fleshing.

The Gibson Bass Stamper



Examples of seven segment digits and their translation into individual numbers

- Clear
- Permanent
- ◆ Individual
 Hide, Skin
 and Drop
 Split
 Identification

The Gibson Bass Stamper





The Gibson Bass Stamper





It cuts seven segment numbers letters or codes into the hide, skin or split. The cutters go right through, and hence are still there when the hide is split.



The machine is computer controlled and has an Ethernet connection for remote communication with the outside world. The touchscreen provides operator setup. I could go into a lot more detail, but there is a web site available for those who have interest.

The Ideal Identification System		
	Gibson/Bass Stamp	
☐ Hygienic, safe, for application in a kill floor or tannery	✓	
☐ Can be applied while the hide is still on the animal	✓	
☐ Human Readable / Human Decodable	✓	
□ Application device connected to the internet	✓	
□ Code can be externally generated	✓	
■ Selectable number of digits eg 4, 5, 6, 7	✓	
□ Lasts through to finished leather	✓	
□ 100% Retrieval	99.9%	
■ Readable with hair on and hair off	Possible	
■ Machine Readable	Possible	
□ Unique code on each piece	✓	
☐ Applied and readable on the grain and the drop	✓	
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So how does this stamper system measure up under the Ideal Hide Identification protocol?

Hygenic, safe for application on a kill floor or in a tannery

We have installed our stampers nearly everywhere, from the kill floor, to a hide store, to the bottom of the hide chute at an abattoir, to after fleshing at the tannery. It is hygienic enough for the use on the kill floor, although on one kill floor we had to use Kosher approved hydraulic oil. We have a guard design that means the machine cannot injure anyone and so it is perfectly safe. Training an operator in use, which we do as part of each purchase, is normally only a few minutes.

Verdict Tick

Can be applied while the hide is still on the animal

One way to ensure correct correlation between the body and the hide is to stamp the hide while it is still attached to the body. Once the hide has been opened up around the butt it is possible to stamp the hide before pulling. A more common way is to stamp the hide at the bottom of the hide chute, with suitable processes in place to ensure there are no mix ups. At one tannery in Australia, where the NLIS (National Livestock Identification System) ensures all animals have an RF ear tag, we scanned the eartag at entrance to the tannery (the abattoir left the face pieces on) and then stamped a unique number, which was later matched to the body abattoir database.

Verdict Tick

The Ideal Identification	System
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Human readable, or human decodable

If you are in a tannery in a foreign country, looking at your hides or skins in a tannery, warehouse or hide store, you want to be able to easily and quickly read the identification. It should be human readable, or if coded, at least easily human decodable. The stamp applied by the Gibson Bass Stamper is just that.

Verdict Tick

The application device connected to the internet

The Gibson Bass Stamper is controlled by an Allen Bradley PLC with an Allen Bradley touch screen. The PLC has an Ethernet port for connection to your local network, from which it can be accessed from anywhere in the world. The PLC even has its own web browser built in. You can watch remotely as each stamp is applied, making it a very valuable production monitoring operation. If you want you can download logs from the PLC which show the date and time of each stamp.

Verdict Tick

Code can be externally generated

As well as the Ethernet communication port (Channel 1), the PLC also has a serial port (Channel 0). Through these you can send a number from your local network to the PLC to be stamped. For example at one abattoir the body number of each beast is sent to the PLC to be stamped. Of course, if desired, the PLC can also generate its own number or code to be stamped.

Verdict Tick

	System
	Gibson/Bass Stam
Hygienic, safe, for application in a kill floor or tannery	✓
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Selectable number of digits

We have made stampers with anywhere from 4 digits to 9 digits. We have considerable experience in designing codes with the minimum number of digits to give you the legitimacy you need in your stamping. For example one factory wanted 4 digits for the date - day and month. We suggested a year day number (1 to 365 or 366) so the same information took only 3 digits rather than 4.

Verdict Tick

Lasts through to finished leather

Our stamp is permanent. It can be cut off, but if left intact it will not fade or erase. It will still be there at the end.

Verdict Tick

100% retrieval

This is a difficult ask, but we get 99.9%+. One customer who did a detailed survey over one week of 9,000 hides, found 7 that they could not positively identify. That is 99.9%. Another customer when asked the same question, said when they inspect the hides in wet blue after sammying, they can never find one that does not have a readable stamp. They get a very small percent error rate in entering the number into the computer, and are working on that, but they do not find any hides without a readable stamp.

Verdict: 99.9%+

Readable with the hair on and hair off

This is possible if the purpose is for an occasional audit. If you know the position off the stamp on the hide you can find the stamp, even if you may need to shave the hair. With hair-on hides and skins, it can be valuable to have a "secret" ID that only you know exists, and only you can read. If you want to read every hide with the hair on at some stage in the supply chain, we recommend a barcoded tag in conjunction with the stamp. We can recommend a very good tag which has been used for this purpose

Verdict Tick. But with some limitations.

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Machine readable

We believe this is possible, but have not done it in an industrial setting, only in a laboratory setting. Many customers start out wanting to read the number with a vision system, but when they see how easy it is to read and record the number with a suitably designed arrangement, they are normally happy not to pursue the vision reading option.

However in trials we changed the stamp to a machine readable friendly (but human decodable) stamp, and the vision system was able to read it consistently and quickly in the quiet of a laboratory. Obviously to do the reading in an industrial setting with heat, steam, and a moving target is possible, but will require some development. If anyone wants to work with us to develop this we are happy to assist.

Verdict Tick But more development needed.

Unique code on each piece

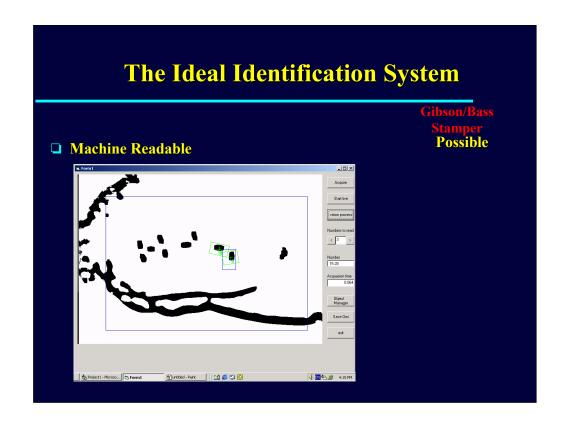
We program each machine to stamp as you request. We have done one machine that was able, at the user's option, to stamp a batch number, an indexing decimal number, an indexing hexadecimal number, or to receive a number for stamping from the local network.

Verdict Tick

Applied to and readable on the drop split as well as the grain

We think our stamper is unique in being able to identify the drop split as well as the grain. The cutters go right through the hide or skin, and as a result the drop is also identified.

Verdict Tick





In summary, individual identification not only contributes to sustainability, but is an essential part of it. And at last the split tanners of the world have a window of opportunity to receive individually identified splits that so that they need no longer be seen as B Graders, and can graduate to Gold members of LWG, and hence make their full contribution to sustainability. For the split tanners to achieve this, it would require their suppliers to have hides which have this sort of identification on the hides that they split.

Is this level of cooperation possible in this competitive industry? We have seen reasons why it should be. Apart from providing split tanners an avenue to sustainability, there are also considerable economic benefits to be gained from individual identification that are not available from paper or batch based systems. I cannot answer the question as to whether any hide tanners will consider this option, but I do believe if individual identification is taken up seriously, the gains to be made in eliminating waste, and taking opportunities that are provided by the depth of knowledge it provides are truly immense.