Corporate Social Responsibility and the Carbon Footprint of Leather

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Summary

From an environmental standpoint the leather industry is an easy target for the thoughtless or prejudiced observer. With the terminology of corporate social responsibility (CSR) and in particular of carbon footprinting frequently abused and rarely clearly defined it is hard for the impartial observer to get a clear understanding of the scientific facts. This paper looks at carbon footprinting in particular and CSR in general and relates them to the specifics of the leather industry. Based on a study of current literature and knowledge it demonstrates that leather can be proud of its credentials and the attacks made on it in these regards are unfounded.

INTRODUCTION

Before society had access to glass, paper, rubber, plastics and many modern textiles leather was the most essential material for industry, warfare and many aspects of everyday life. It has constituted one of the world's largest industries for most of man's time on earth. As such it has always had quite a large 'footprint'. Long before modern science understood the processes fully the industry used chemistry, biotechnology and technology copied from other areas or from trial and error.[1] Blood, dung, brains and eggs all added to an atmospheric mix of putrefying hides and skins which both used and fouled large volumes of water. Leather was regularly defined as a nuisance industry and gained wide recognition which lasts to this day as a source of pollution in terms of air, water and solid wastes.

The intense examination currently being undertaken in the leather industry, of matters related to Corporate Social Responsibility inevitably makes this at best an interim paper intended to highlight opinionated views from various sides which are currently framing the industry discourse. In particular a number of significant papers have been published in the last decade which have been used to damage the image of leather and affect customers intentions to use leather as a component material. These papers have never been challenged by the leather industry. Ongoing research within industry and academia will inevitably add to this over the coming months and years.

The paper first addresses the carbon footprint aspect along with the wider processing matters related to the leather industry. Then it looks at the situation beyond the tannery and in particular the final consumer. In drawing conclusions examination is made of the implications for the value chain from raw material to final consumer.

CORPORATE SOCIAL RESPONSIBILITY AND THE CARBON FOOTPRINTING OF LEATHER

In terms of recognising why carbon footprinting has become such a significant topic for leather it is necessary to understand the concept of stakeholder theory and the implication that what we do as tanners cannot relate only to our activities within the tannery walls. The traditional definition of a stakeholder is 'any group or individual who can affect or is affected by the achievement of the organization's objectives'[2] and for the leather industry, that involves groups extending far beyond the traditional limits of a specialist industry. This definition has to be considered alongside the new definition of Corporate Social Responsibility put forward in 2011 by the EU 'the responsibility of enterprises for their impacts on society'.[3]

Carbon footprints are now being measured for nearly all products in the world.[4] The measure most commonly used is calculated in CO_2 equivalents (CO_2e) where other greenhouse gases are counted in terms of CO_2. This whole scientific area is very complex and it is exceptionally difficult to be sure that a material is being treated correctly. Considering the parties who have looked at leather it is impossible to feel that leather is at any stage being considered objectively.

The carbon footprint is most clearly defined as 'the total set of Green House Gas (GHG) emissions caused directly and indirectly by an individual, organisation, event or product'.[5] A number of gases can be involved with the dominant man-made green house gas being CO_2 along with methane, nitrous oxide and refrigerant gases. The other gases are normally estimated in terms of carbon dioxide equivalents giving the figure for CO_2e. 'This means that the total climate change impact of all the greenhouse gases caused by an item or activity are rolled into one and expressed in terms of the amount of carbon dioxide that would have the

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same impact'.[6] It is important to note that the convention here is to include all the gases covered in the Kyoto Protocol considering the impact over 100 years. CO_2 is the gas that stays in the atmosphere much longer than most other gases and the figures take account of this. Some commentators consider that the conversion underestimates the figure for methane while others the reverse: it is an important aspect as methane is one of the gases heavily related to ruminants such as cattle and sheep.

'All those who work on carbon footprints are careful to avoid what has been called 'carbon toe-prints'[7] where a product is looked at in isolation and important associated areas are overlooked. For example the household carbon footprint is not considered accurate if it only considers home energy and personal travel habits without taking into account all the goods and services purchased. This is important for the leather industry as many important industry figures choose to condemn leather solely on the basis of the CO_2e figure for the raw material. Adding in emissions from livestock means that saving in the tannery will have negligible effect on the total CO_2e for leather as the livestock element on current calculations will always be of the order of 90% of the total.

To understand how the tanning industry found itself in this position it is necessary to go back to the term 'sustainability'. The definition most used is from the Bruntland Commission: 'sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.' Bruntland indicated that this definition of sustainability contains alongside it two key concepts:

– the concept of needs. In particular the essential needs of the world's poor, to which overriding priority should be given: and

– the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.[8]

The Bruntland Commission report focused heavily on the fact that the World has a fixed amount of land to meet the needs of a population which they expected to grow to 6.5 billion in 2025 (as opposed to the actual of 7 billion passed in 2011). The report discussed the growth in demand for meat and the associated livestock populations. These considerations were subsequently the focus of another influential paper from the FAO in 2006 called Livestock's Long Shadow[9] which was launched with headlines such as that in the *Independent* in the UK on the 10th December 2006: '*Cow 'emissions' more damaging to planet than CO_2 from cars.'*

Although many errors are apparent in this FAO Steinfield report the paper was never challenged by the leather industry and remains the foundation for much thinking about CO_2e figures for leather. It has provided the source material for many articles and web discussions related to meat consumption, the future of agriculture and especially all those wanting to attack anything to do with leather.

In recognising how damaging this has been to leather one of many influential texts looking at the carbon footprint of various products measures footwear in terms of CO_2e at 8kg for a pair of synthetic shoes and 15kg for all leather shoes.[10] The larger figure for leather is explained: 'I have measured the higher figure for all-leather shoes on the basis of the carbon intensity of cattle farming'.[11]

As long ago as 1999 Weidema[12] suggested an alternative protocol for handling materials from natural resources which would eliminate this element from the carbon footprint of leather. He argues that arbitrary allocation ratio of different co-products in terms of the

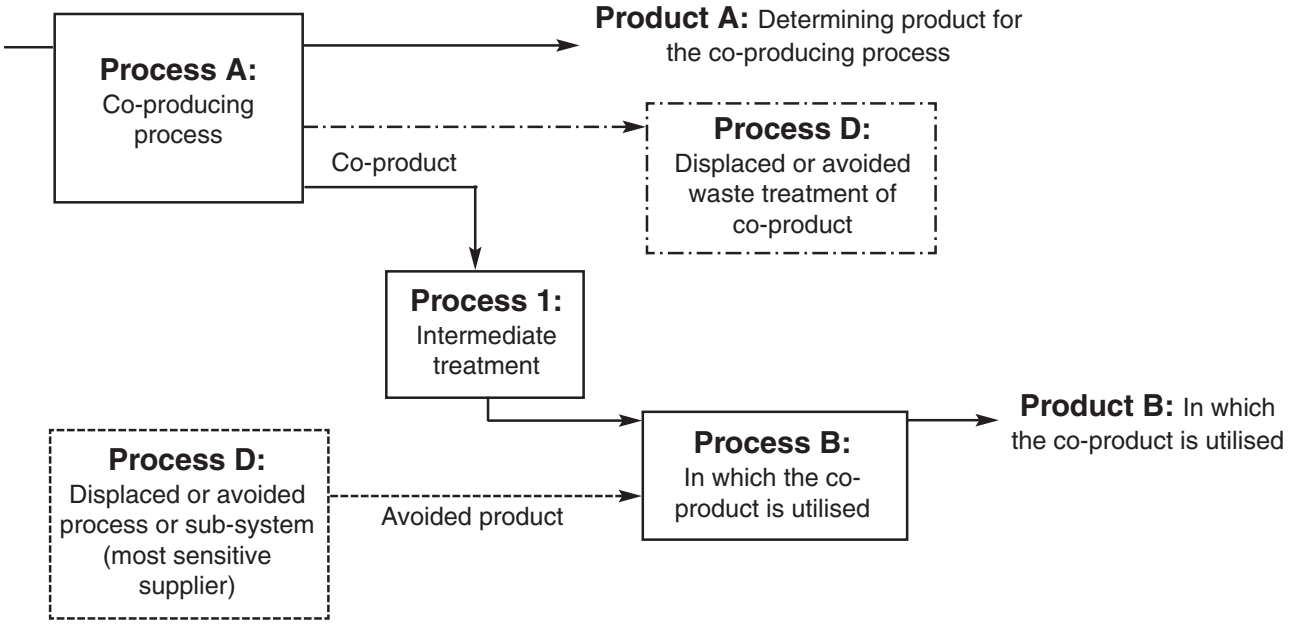

Figure 1. Model for describing system expansion and delimitation in relation to co-products.[12]

calculation of environmental impacts is wrong. It has become a standard because of the belief that a calculated process would be too complex to be workable. Hides are briefly mentioned in a case study related to the co-products from a cow, essentially milk, meat and butter, which indicate his approach to be applicable to the leather business.

Essential to the Weidema approach is identifying the key product for which the animal is kept. In well over 95% of the leather industry the hide or skin is by far the least relevant item. The key product is defined by Weidema as the determining co-product and all others as non-determining co-products.

The concept presented is that the determining co-product should carry 100% of the environmental weight and the non-determining co-products should carry zero. With regards to hides and skins since they are essentially fully utilised to make leather the following procedure is recommended:

Under the conditions that the non-determining co-products are fully utilised in other processes and actually displaces other products there, product A shall be credited for the processes, which are displaced by the other co-products, while the intermediate treatment (and other possible changes in the further life cycles in which the co-products are used, which are a consequence of differences in the co-products and the displaced products) shall be ascribed to product A (the determining co-product).[13]

Further details are given for waste that might come from the non-determining co-product:

When a non-determining co-product is not utilised fully (*i.e.* when part of it must be regarded as a waste), but at least partly displaces another product, the intermediate treatment shall be ascribed to product B, while product B is credited for the avoided waste treatment of the co-product.

Details of this are still being studied by experts in the leather industry but it would appear to offer a fait and realistic way for environment calculations related to leather, such as carbon footprints, to be legitimately started at the abattoir and to ignore those related to the rearing of the livestock.

It is not clear why the Weidema paper has been overlooked for over a decade but this case was presented at the 18th UNIDO[14] panel in Shanghai in September 2012 and is being prepared for application as a CE standard in 2013.

This fits with the views of many in the leather industry who consider leather as a by-product, or even a waste product, of the meat and dairy industry. The argument is that no cow or sheep is killed for its hide or skin and that as a consequence the tanner cannot logically accept a large carbon footprint when it enters the tannery. Some even argue that since the hides and skin would be difficult to manage without tanneries the tanner should be given a carbon bonus for using it.

This argument has come very late in the day for the leather industry with many brands already publishing carbon footprints for leather containing products which include the livestock element. So while the industry can expect that the majority of its customers will be pleased to see a figure that more accurately reflects reality there will be many who will be hard to win over. At the same time some in the leather industry are concerned that tanners should not ignore the livestock side of the business, since animal husbandry and welfare plays a large part in hide and skin quality.

Some of the key points in this debate are worthy of itemising.

The clearest definition of a by product which fits the situation of leather would appear to be one which defines a by product 'as an incidental or secondary product made in the manufacture or synthesis of something else. Generally regarded as having less value and requiring considerable further processing to add value.'[15]

Such a definition could be construed as fair for leather as hides in the UK as of June 2012 were valued at around 3.5% of the carcass value. The large amount of processing needed to make leather is readily accepted. As such this appears an excellent definition of the raw material for leather being a by-product.

The first problems start to arise when it is accepted that this covers some 95% of the leather in the world – perhaps even up to 98% – but certainly not all. Skins from Australian kangaroos and New Zealand possums are neither by-products nor non-determining co-products yet the arguments that make them suitable raw materials for leather are very clear, and offer an alternate clear justification apart from Weideman, for a zero CO_2 figure on entry into the tannery. The value relationship varies with raw materials such as ostrich, reptile and other exotic skins that are not so easily classified. The leather industry cannot ignore these marginal materials completely as they are becoming increasingly important in the luxury segment and for many brands who are quite major users of leather.

Examining the 98% of leather also requires further thought. First we must look at Life Cycle Analysis and Carbon Footprints and such documents as ISO 14040 and Home and Matthews.[16] The latter paper is part of a project designed to allow production of a software tool which provides a standard means of analysing the GHG balance and emissions-saving cost-effectiveness of biomass energy technologies. This paper sees four outcomes in terms of products:

– main products,

– co-products (which involve similar revenues to the main product),

– by-products (which result in smaller revenues),

– and waste products (which provide little or no revenue).

The paper goes on to say: 'According to ISO14040, the preferred allocation procedure uses a substitution approach, where the main conventional process for producing a co-product, by-product or waste product is used to generate comparative effective credits, which are then subtracted from the life cycle inventory of the process chain under investigation.[17] If this is understood correctly then the meat industry benefits from all abattoir by-products being highly rated and

deducted from the CO_2e of the meat. One of many instances where the leather industry needs to take care that it is not being mis-represented.

In the preparation of this paper we have been unable to identify what percentage of the CO_2e of cattle was applied to the hide going into the tannery by Berners-Lee but we are pretty clear that it is not likely to be less than 10%. SGS, as used by PrimeAsia in their current CO_2 calculation, take 7% of the cow's life overall omissions. We are advised that the calculation used by Puma is 15%. 'Normal convention is to attribute the carbon footprint of the whole cow to its various products in the same ratio as the financial value of those products. You can't call the hide a by-product of zero value unless you are given it free of charge'.[18]

The alternate routes for hides and skins to take are likely to form the basis of considerable further study. There is clearly no capability today to use the estimated 7-8 billion tons of hide and skins produced per annum but it is hard to imagine that the gelatine, sausage skin, medical and cosmetic industry would not soon find ways to make use of it. Indeed the gelatine industry has already been complaining about the shortage of material early in 2012:

'Chinese shoppers' desire for handbags and luxury cars is having an unfortunate knock-on effect for those relying on cheaper treats – pushing up the price of jelly babies and wine gums.

The link is gelatin, some 360,000 tonnes of which is sold every year. This mainly comes from cattle and pig skin; and with tanneries snapping up hides to feed Asia's voracious appetite for luxury leather goods, sweet makers are being forced to cough up more for the ingredient.'[19]

In terms of the EU this whole debate is one only of perception and public relations as the legal position is such that an item is either a product or a waste product.[20]

Given that it is now accepted that cattle populations will not grow in line with human population as they did in the 20th century the long term demand for both leather and gelatine seems likely to increase the value of hides. There will be a case to analyse a hide and skin from different animal types, origins, and husbandry specifically. To date, a grain fed cow hide, a pasture fed cow hide, a buffalo from Pakistan, a yak from Tibet, a kangaroo from Australia, a sheep from New Zealand, a pig from China and a camel from North Africa are all assessed with the same carbon footprint formula. Even separation of beef and dairy cattle is unusual. A detailed analysis provided by Desjardins[21] shows how wrong this is.

Whatever the outcome of the Weideman proposal, it remains clear that tanners must understand the calculations that go into the figure for CO_2e that attach to livestock. Given that Livestock's Long Shadow has become the foundation document for most analysis it is worth noting that Prof. Frank Mitloehner[22] has already persuaded the FAO that the calculation of emissions from transport were a gross underestimate and there are many aspects about the calculation for livestock that require further analysis.

It should be remembered that throughout history cattle and sheep are herd animals which mostly lived with nomadic peoples who moved over the land grazing and fertilising the land with animal manure as they passed. When people lived in villages or small towns omnivorous pigs were more common as they were perfect for interacting with humans and feeding on food wastes. It is not part of this paper to get involved in the arguments about farming methods but the point that cattle and sheep convert grass into protein and that pigs are expert users of human food wastes including meat should not be overlooked.

One major calculation in the Steinfield report relates to deforestation which has caused deep concern to the leather industry as a result of the Greenpeace report *The Slaughter of the Amazon*,[23] produced in 2009. This is another report that has not been independently analysed by our industry although it is accepted generally as having raised some valid points. The leather industry has responded strongly to this situation. Again this needs to be considered in a wider context. First there are many demands on land use in the world and sometimes decisions lead to unintended consequences. With regard to the Amazon and deforestation two aspects are worthy of consideration.

– Issues in Europe related to BSE scares in the 1990s and foot and mouth in 2001 led to a temporary ban on feeding all swill and animal residues to any animals, including pigs and poultry. This was later turned into a permanent ban. As a result the European livestock industry had to source feed from elsewhere and there is no doubt this put pressure for growing more soya in Brazil. It is hard to accept the logic of growing soya in order to feed soya meal to European pigs that ought to be eating food wastes that instead now go into landfill. To blame cattle ranching is simplistic; the causes for deforestation are far more complex and need to be better understood. Attacking prominent brands over cattle and meat in order to achieve quick publicity is not the best way to achieve scientifically sound outcomes.

– In his 2006 calculation Steinfield attributes 34% of livestock emissions to deforestation.[24] Steinfield argues that only in Brazil is deforestation an issue and that two thirds of the problem relates to beef and the rest to soya bean. The shift towards the major blame being put on beef was an unexplained reversal of the author's stated position in previous papers. That said it is anyway an error to apply deforestation to the equation *via* this methodology. First a specific period was chosen when deforestation was at its most extreme and second to use it in this way is to take a one-off land use change and ascribe it to an ongoing supply situation. This is akin to putting a balance sheet item in the current account and if applied to a rainforest needs to be calculated together with the removal of agricultural land to build a new suburb or road system in other parts of the world.

There are other related points. By 2006 Nepstad[25] argued that the Brazilian beef industry in the Amazon was 'veering towards regulation and even conservation'and in any case the Brazilian beef

numbers that might be related to the Amazon account for less than a quarter of the world's cattle, so slapping a huge carbon tariff on all cattle is more ideological than scientific. Everyone wants to preserve the Amazon biome and the leather industry is keen to play its part, but this does not feel like the correct way.

In any analysis of Steinfield's *Livestock's Long Shadow, further views from Fairlie*[26] should be considered. Nitrous Oxide emissions count for around one third of the cattle emissions calculated in the FAO paper but without animals nitrogen would still be needed for food crops which would continue to emit about the same amount of N_2O. Fairlie points out if we eliminated livestock then that protein would have to be replaced by even more vegetable protein which would need further nitrogen. Given all this Fairlie argues that we should at least halve the Steinfield/FAO figure for N_2O.

Methane is also a key aspect: and it is the one we find most mentioned as the killer problem for meat in terms of carbon footprint. Methane is also one third of the total emissions of livestock. Methane and ruminants go together along with the other large source of methane which is natural wetlands. One immediate point to note, if all ruminants are removed – cows, sheep, goats and other ruminants (plus horses whose long colon allows them to digest grass and produce methane) – then we would need to produce more plant crops. The Intergovernmental Panel on Climate Change (IPCC)[27] figures suggest that immediately this would replace half the methane produced from animals. A second point is what happens to land from which livestock is removed. A proportion can be put to woodland but much of the land in the world is too dry for forests. From experiences in Scotland and Tanzania Fairlie believes that there would be major repopulation by wild animals – deer, wildebeest, buffalo gazelles, giraffe and zebra. Thus we would just be replacing one ruminant with another, no doubt saving some emissions but nothing like the figures suggested. What is also clear is that the science of the production of methane by nature is far from fully understood and this additive approach of piling every emission onto livestock is quite unscientific.

One of the outcomes of this very negative view of livestock on the planet has been to play down the damage done by carbon dioxide emissions in transport and fertiliser production which is important in intensive farming and to put a bigger emphasis on the other gases. 'In agriculture N_2O dominates, with substantial contributions from methane.'[28] This Williams paper is otherwise known as the Cranfield University Study and does not appear to carry forward all the errors in the FAO report; but it does maintain this bias against traditional agriculture. It is used as a major source for Berners-Lee's calculations.

Those who are wishing to push a predetermined point of view in forming the climate change policy for agriculture by focussing on emissions to the biosphere are directly attacking livestock farmers and others like traditional Asian rice farmers. Instead this form of calculation rewards more intensive farming which depends on fossil fuels for the production of fertilisers or industrial style poultry farming where the energy intensive element is transferred into CO_2 figures for transport and industry.

The concern here is that if the planet requires a quick repair then it is livestock which is being lined up to be dramatically reduced. In making these points Fairlie also develops a logical argument that methane itself is being unfairly treated. First using IPCC data the short life of methane in the atmosphere means that a reduction of less than 7% of methane emitted by human activities would be enough to prevent any further rise of methane in the atmosphere. This can be achieved by halving emissions from landfills, by reducing the use of fossil fuels by a quarter or reducing livestock emissions by a quarter. To achieve an overall stabilisation of atmospheric greenhouse gases CO_2 would need to be reduced by 80%.[29] In fact the IPCC figures show that methane in the atmosphere has remained stable since 1999 so it is curious that methane is coming under such an attack from the FAO. Attacking the hundreds of millions of small rural farmers around the world who use little or no fossil fuels but have 'inefficient' cows appears quite perverse.

Taking this argument much further would take tanners into the debate over pasture feed *versus* grain fed cattle. One powerful quote from Fairlie is worth a careful read as he looks at current thinking in agriculture emissions:

'The exaggerated emphasis on the alleged four or five per cent of GHGs emitted by cattle, and the mendacious rhetoric about cows causing more global warming than cars, look suspiciously like an attempt to shift some of the blame for global warming from below ground to above ground, from fossil fuels to the natural biosphere, from the town to the country and from the rich nations to the poor'.[30]

CARBON FOOTPRINT IN THE TANNERY

While until now the leather industry has stayed clear of the carbon footprint before the tannery door the industry has hurried to meet demands from customers for a figure for tanning itself. In addition water and energy figures are also demanded. Within the industry we have a number of leaders such as Prime Tanning footprinting leather,[31] Isa TanTec LITE Leather label, Scottish Leather Group with their low carbon leather and in Germany the ECO2L label.[32]

Behind these are systems, organisations and structures that show a considerable dedication to trying to understand a very complex concept and to act with great integrity. The EU BREF Best Available Technology[33] and Best Energy Efficiency for Tanning (BEET)[34] documents are frequently used as a foundation and the Leather Working Group (LWG)[35] has worked tirelessly to set measurable standards for energy, water, banned substances and other environmental factors.

A number of points can be made from all this. First that the manufacture of leather by modern methods

where proper consideration is given to the management of all wastes and the use of inputs including water, energy and all chemicals can be characterised as a good and defensible manufacturing process. The historical image of tanneries as dark satanic places doing harm to the planet in multitudinous seen and unseen ways is entirely false. The chemistry is now well understood in terms of all the materials that are used and how they should be handled. As such attacks on tanners as polluters, users of toxic chemicals, and huge consumers of water can be rebuffed by an industry that has been transformed over the last fifty years.

Tegtmeyer[36] presented figures for some areas of achievement with water at 110 litres per square metre of leather. Saigon TanTec was reported in 2010 as using 33 megajoules (MJ) of energy per sq. m. of leather compared to the industry standard suggested by BLC-LTC of 52MJ.[37] Similar energy figures come from PrimeAsia whose website also explains in detail the calculation of 5.28kg CO_2e per sq. ft. of a 1.2-1.4mm leather which includes 'all GHG emissions including the raw material inputs and transportation of those materials to PrimeAsia, manufacturing of the leather at a PrimeAsia facility, and transportation of the finished leather to a shoe factory are accurately measured.'[38] PrimeAsia accounts for product greenhouse gas emissions according to ISO 14064-3: 2006 as meeting the requirements of PAS 2050: 2008 (Publicly Available Specification that came into effect in 2008).

The German Energy Controlled Leather ECO2L system sets very clearly defined limits in terms of system boundaries for measurement in its Guidelines.[39] The production of chemicals and the rawhides are amongst the items excluded as are delivery of finished products and by-products.

Additional improvements to be expected include even more improvements in drum design to further reduce energy consumption, after the new internal configuration of tan drums has shown big savings. Also, greater use of geothermal energy and solar power can be expected given the location of many tanneries in the world. Geothermal power is already being used by tanneries in Iceland and Ethiopia and there is a major tannery solar farm in Vietnam.

While tanneries have worked successfully to reduce water consumption, work at tanneries such as Simona Tanning in China have used both membrane filtration and reverse osmosis in order to re-use a large proportion of the water in the tannery and in general, what might be best defined as 'closed loop' systems are gaining much more traction within the industry. This is the approach which is part of the Scottish Leather Group strategy which is built around their thermal energy plant where pyrolysis and gasification turns all the company's solid wastes to energy with almost zero solid residues.

In addition to this consideration must also be given to by-products from the tanners. It is often noted how little of the rawhide bought by the tanner actually ends up as saleable leather with large amounts going into 'waste' streams such as trimmings and shavings. Tanners are generally well aware of many good uses for these materials which were both utilised and publicised over the last 15-20 years[40,41,42,43,44] but cost and convenience have made it easier to dump them into landfill, or worse. Given the importance of corporate social responsibility for the tanning industry, quite apart from the increased cost of landfill and the increased value that may be obtained from these waste materials, tanners now need to review every waste stream from their plants. This includes fleshings, splits, trimmings, shavings and buffing dust. Glue, bio-diesel, gelatine, chrome and feed protein are all items which need to be comprehensively reconsidered.

This leads the manufacturing discussion onto the concepts of cradle to cradle manufacturing now often described as the 'circular economy'.[45] This sees an approach where if products and processes are designed correctly materials are not dug from the ground and used once, or possibly with recycling twice, and then put into landfill. Instead the design undertaken at the onset looks to being able to regain the material at the end of the life of the article and reuse it for its original intended use.

Under this approach materials are identified as either organic or chemical nutrients with the organic nutrients being able to return safely to the land while the chemical nutrients are extracted at end-of-life. The starting place for most tanners would be the extraction of chromium from all tannery wastes. This was being done routinely in some Milwaukee tanneries some years ago and needs to be reconsidered by our industry as a whole. Going forward into the new world of limited and non-renewable resources the concept of taking a raw hide and tanning it with chromium only to take large amounts off as trimmings and shavings to go into landfill would appear untenable.

Biodegradability is another area requiring considerable work with leather as we know that chromium tanned leather does not easily biodegrade and vegetable tanned leathers can exist for many centuries in certain conditions. Leather left in the forest after the closure of North American vegetable tanneries in the 1880s has recently been checked at the University of Northampton and shown to have had almost no deterioration in tanning quality over the last 130 years. In general a substance, component, or product is called biodegradable if it can be converted by living organisms into its basic components (for example into carbon dioxide and water). In the EU a substance is considered to be 'Readily Biodegradable' if more than 70% of the substance is converted within 28 days. The definition supported in the EU regulation is 'the extent to which degradation into carbon dioxide (CO_2), water and minerals takes place'.[46] Tanners must therefore be very careful, and have done some proper testing, before calling any leather biodegradable.

While forward thinking tanners can feel well pleased with their current level of technology and the excellent outcomes their investments are achieving the industry has shown a considerable ability to self-harm.

'Greenwash' involves environmental claims used carelessly or wrongly to promote products or to deliberately confuse the market. The leather industry has suffered from a profusion of terms such as 'chrome-free', 'metal-free', 'no heavy metals', 'organic', 'biodegradable', 'bio-' and 'natural' which are frequently presented without proper definition or any consideration of the wider context. Some of this comes about because customers are looking for a marketing point of leverage but tanners must be careful about the implications of what they say. A chrome tannery that makes one line of non-chromium leather will do more harm than good feeding the consumer market with the opinion that all chromium-tanned leather is bad. Germann[47] highlighted some important points about our current state of technology when he stated that:

1. In terms of the current state of knowledge chromium when properly used remains one of our best tannages.

2. While vegetable tannages are unsurpassed for certain end uses there are not enough trees in the world to consider a sizeable shift of tanning from chromium to vegetable.

The fact that the leather industry is working so furiously to find new methods of tanning hides and skins is highly commendable, but it is hard to see the value of damaging the image of leather tanned by existing successful and appropriate means while these are being developed.

THE CONSUMERS

Tanning leather is part of long chain and the tannery in nearly all cases works in the business to business environment. It sells into a chain which is part of a network. That is to say that the tannery has an immediate buyer that may be a shoe or garment factory which in turn will sell to a brand and then a retailer before it gets to the final consumer. This chain will be embedded in a complex network of others such as advisors, consultants, legislative bodies and consumer groups who can have a profound effect on how well the material is received.

Positioning leather correctly as an ingredient is a key element in any tanning organisation's business. As seen with 'greenwashing', some tanners are careless in this regard and this causes confusion about the leather's true value in the market. In addition not all tanners are as conscientious as they ought to be in terms of attaining the best standards and it only takes a small number of polluting events or other incidents for the reputation of the 'brand' leather to be damaged.

Furthermore while the majority of tanners see leather as a premium material we have some in the world who still market it as a commodity. Selling leather into low priced markets such as some areas of furniture and fast fashion inevitably puts pressure on tanners to cut corners and leave the rest of the industry to be damaged by implication. The writings by the influential journalist Lucy Siegle[48] are typical: 'But as well as leather being one of the most prevalent materials in our wardrobe, its production and processing phase is one of the most polluting systems that humankind has managed to come up with'. She continues with a description of a visit to Uttar Pradesh in India and describes current issues with tannery pollution getting into the Ganges. The number of places in the world to which such a journalist may travel to see unsatisfactory tanning sights is sadly quite large and does extra harm when built into a narrative by the anti-leather and anti-animal lobby on the internet.

Currently a significant proportion of leather is sold under circumstances that make it a commodity only differentiated by price. The fast transfer of production out of the west replaced many old city centre tanneries with new ones with better systems for management of all environmental matters. However in some parts of Asia and Africa where legal and environmental regimes have been weaker or less evenly enforced, some of the old residual tanneries which head up the group survive only by cutting price.

Leather which is sold as a commodity is very often accompanied by issues of poor corporate social performance. These are issues which are picked upon by pressure groups which use a strident reporting style to push their opinions out to a narrow audience. Up until now the leather industry has chosen to ignore this activity yet there is considerable evidence of spill-over into the general public and perhaps more importantly into key user groups.

Research for Leather Naturally! has shown that some designers refuse to use leather at all, and others will not use leather that contains chromium, the latter often on the simplistic basic that 'it is toxic'. Some fashion schools are unwilling to teach leather as the staff are nervous. Evidence of the crossover into influential and importer user groups are the negative statements made about the use of leather from companies such as Pentland, Timberland and Puma.[49] The automobile industry is also seeing increasing attacks by non-woven and PU materials. Often this is a build up of nervousness about the CO_2e of cattle plus comments about the chemicals and waste involved in tanning creating a persuasive case against leather.

CONCLUSIONS

Leather is an excellent material and tanners are dealing effectively with all the processing issues of the past. Leather compares exceedingly well with other natural and manmade textiles and synthetic materials.

The current calculation which asks tanners to accept a charge from the CO_2e from the farming of the hides and skins, their origins and husbandry methods, of 7% of the cow's lifecycle emissions means that some 90% of the total CO_2e comes from an area over which the tanner has little or no control. Acceptance of the Weideman methodology as a standard will eliminate that element and the CO_2e figure for leather will immediately fall to one comparable with competitive materials such as some textiles, plastics and synthetics. Leather will win as a sustainable material of

choice in these circumstances as it does not come from a fossil fuel base.

Nevertheless the future limitations on raw material supply, the importance of integrity and good CSR in the supply chain means that tanners will have to develop a greater knowledge of husbandry and land use. If cattle and sheep are to be denied land then consideration must be given to land used for tobacco, luxury crops like asparagus and for bio fuels. Many of these issues have never been opened up for discussion. Livestock arguments need to be laid out more honestly and the many errors need to be countered with tanners helping other bodies balance the global public relations arguments, and taking care to look out for the leather industry which no one else is doing.

Within our industry it would appear necessary to exert some internal pressure to reduce the amount of activity which does not comply with modern norms of social responsibility. The leather industry is one of the world's most successful in creating employment – especially in leather using industries such as garments and footwear – yet there is no gain if people and the planet are being damaged in the process. And it is without question that such activity damages the 'brand' leather for the industry as a whole.

More than anything it would appear that the industry needs two things – good science and well executed promotion.

Work on going at FILK in Germany and in Northampton in the UK, where areas such as cradle to cradle and carbon footprints are currently the subject of study, require the full support of the industry. The University of Northampton also continues to work on alternate uses for collagen and other materials such as hyaluronic acid which become available during the processing of leather in the tannery.

Whatever the reasons, and despite the huge improvements made by so many tanners around the world, the leather industry has not moved ahead of the arguments. It is challenged by bad science, consumer misunderstandings, changing demographics and a lobby that has been left to promote a fossil fuel based agricultural system as being better than the natural environment. As Fairlie puts it, 'cows (and therefore leather) have been around for thousands of years, while global warming takes off with the discovery of oil... A child could deduce that if we were serious about preventing global warming, the most obvious and reliable course of action would be to leave all fossil fuels in the ground.'

Leather clearly has a very good, natural, sustainable story. It is an honest material, true to itself and is one which tanners need to be proud of. Well made, well sold and incorporated into well designed articles it lasts far longer than alternatives and grows in beauty with age. It needs to be both defended and promoted based on well researched and objectively examined science and using the proper dedicated tools of modern marketing.

(Received January 2013)

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