



NSW WOOL INDUSTRY & FUTURE OPPORTUNITIES

A report to the NSW Department of Primary Industries from Miracle Dog, Poimena Analysis, Scott Williams Consulting and DAFWA

Supporting Papers

Paper 5: Animal health and welfare, the environment and societal expectations

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NSW Wool Industry and Future Opportunities

A report to the NSW Department of Primary Industries from Miracle Dog, Poimena Analysis, Scott Williams Consulting and DAFWA

Authors:

Russell Pattinson (Miracle Dog)

Chris Wilcox (Poimena Analysis)

Scott Williams (Scott Williams Consulting)

Kimbal Curtis (Department of Agriculture and Food Western Australia)

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Animal health and welfare, the environment and societal expectations

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Introduction

Every industry relies upon a 'social licence' to continue operating. 'Social licence' is defined by the US Centre for Food Integrity as:

The privilege of operating with minimal formalized restrictions (legislation, regulation, or market requirements) based on maintaining public trust by doing what's right. ['Public trust' is a belief that activities are consistent with social expectations and the values of the community and other stakeholders]¹

Societal attitudes to the environment, chemical use, food safety and animal welfare have evolved significantly in recent decades, in Australia and around the world. These attitudinal changes have in turn changed customer behaviours, including those of retailers and other intermediaries, and also the political / regulatory environment. As a result farmers are no longer free to operate purely as they wish but must respect the social licence under which they operate.

These pressures affect different agricultural enterprises in different ways. Wool production requires extensive areas of land², the stewardship of animals and significant reliance on chemicals. The industry has already experienced the debate on mulesing, to give one example, and it does not appear that public pressure on the way woolgrowers operate will ease over time.

Situation analysis

Animal health & welfare

Animal health

Animal diseases represent a significant source of loss to sheep producers, both from the upfront prevention or treatment costs and from unavoids losses in production including deaths. A report for Meat & Livestock Australia (MLA) and Australian Wool Innovation (AWI)^{3,4} concluded that the most economically-important diseases affecting the sheep industry in Australia are:

- Internal parasites;
- Flystrike;
- Lice;
- Post weaning mortality;
- Perennial ryegrass toxicity (PRGT); and
- Perinatal mortality.

There is no reason to believe that the major disease ranking in NSW specifically would differ from this profile (except possibly in the relative ranking of PRGT). Internal parasites and flystrike dominate, with national annual costs of approximately \$369m and \$280m.

Animal health costs are already built into wool business models, so the important question for future scenarios is whether animal health will become a relatively bigger or smaller issue than it is now. Key observations in this respect would be:

- A major challenge is increasing resistance of gastrointestinal worms to the drenches on which there is heavy reliance for control. New classes of drench are launched periodically (see below) but not at a rate that outstrips the development of resistance. However, adopting a suite of other control options including the

¹ Arnot (2011)

² Except shedded sheep operations, of course, which have their own welfare challenges

³ Sackett et al (2006)

⁴ An update and expansion of this study is currently being carried out under MLA funding but the report is not yet available



combining of drenches is generally keeping the resistance problem at a manageable level.

- Industry-funded R&D (MLA and AWI) on animal health is being continually carried out, seeking improved disease diagnostics, treatments, prevention and control strategies, including breeding for disease resistance. These programs produce regular incremental innovations but no particular breakthroughs are anticipated.
- Commercial animal health companies also produce a regular stream of new products (antiparasitics, antimicrobials, vaccines, nutritional products such as trace elements), the most significant of which for sheep are usually new worm drenches. Conventional wisdom is that multinational animal health companies are progressively reducing their investments in sheep-related new product development in favour of more lucrative pig and poultry industries, but new parasiticide products have been released in recent years.
- Health management makes sheep a relatively labour-intensive enterprise – apart from shearing, the main labour-intensive procedures such as crutching, drenching, dipping and jetting, mulesing / tail docking and vaccinating are all health-related. These provide a major disincentive to running sheep (when compared for example with highly technological cropping systems). There is little prospect of these procedures being made redundant in the near future except by the adoption of ‘easy-care’ sheep such as Dorpers which are not specialist wool-producing animals.

Aside from these ‘steady-as-she-goes’ trends, two wildcards relating to animal health can be imagined:

- Ovine Johne’s disease (OJD) has been a highly controversial disease in NSW. The OJD debate has been less heated since recent changes placed responsibility for control very much back on producers and an effective vaccine has been progressively taken up. However, there remain lingering questions about a possible link between the OJD organism and Crohn’s disease in humans. Were a link to be definitively established and accepted, sales of sheepmeat (with knock-on effects on wool profitability) and beef as well as dairy products could be adversely affected. Establishment of such a link seems unlikely but not out of the question.
- An exotic or emergent disease such as foot-and-mouth or sheep and goat pox could affect flocks in NSW or elsewhere in Australia with sudden dramatic effects on market access for wool and sheepmeat nationally. Bluetongue has already been found in sheep in Australia and there is a concern that the virus will spread south as the territory for its *Culicoides* vectors expands with climate change. A future emergency animal disease outbreak is a very real possibility.

Predation

Dingoes and feral dogs (usually termed, collectively, ‘wild dogs’), foxes and pigs are all predators of sheep across Australia. Dogs, however, have become a particular problem in recent years. Despite better methods of trapping and baiting, the sheep industry in the pastoral zone is shrinking due to predation by dogs, for two reasons: a reduction in the farm labour force, leaving fewer people to detect and manage dogs; and the reduced use of netting fences⁵.

Dogs cause more than just losses of livestock, although these losses can be very large; they also cause considerable stress and upset for flock owners.

⁵ Allen & West (2013)

In NSW, wild dogs are found mostly in the north-west of the state as well as along the Great Dividing Range and coastal hinterlands. The State has a Management Strategy⁶ that emphasises coordinated planning and management starting with a ‘nil-tenure’ approach – that is, working across a broad landscape that ignores land titles and boundaries and focuses instead on the population dynamics of the dogs themselves.

Regulation of animal welfare

The way people think about animal welfare is changing. Whereas animals have historically been regarded as the property of humans, and subject to protection only to the extent that an owner could reasonably afford it, they are increasingly being regarded as sentient beings with the right to enjoy ‘five freedoms’ (freedom from hunger and thirst; discomfort; pain, injury or disease; to express normal behaviour; and from fear and distress).

Examples of how the growing international concern for animal welfare is being manifested are:

- The growing involvement of the World Organisation for Animal Health (OIE) in developing and promulgating international animal welfare standards⁷;
- The increasingly stringent animal welfare standards of European countries in particular, for example the requirement in Switzerland and other countries that castration of lambs or calves must be carried out using anaesthetic, at any age⁸; and
- The rapid rise in offering of animal law subjects in law schools around the world (Figure 1 – which may significantly underestimate the present number, as there are 14 Universities teaching animal law in Australia alone⁹).

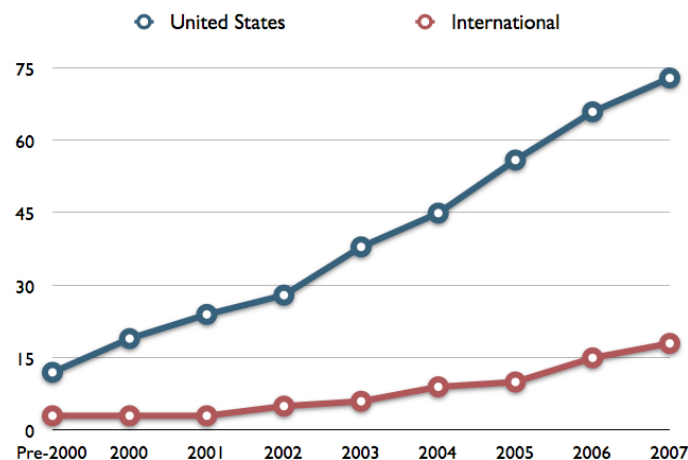


Figure 1 Rise in the number of Universities offering animal law courses between 2000 and 2007 ('international' means 'outside of the United States')¹⁰

In 2014, after a protracted process, the Australian Animal Welfare Standards & Guidelines (S&G) for Sheep¹¹ were finalised by a diverse stakeholder group and have been sent to the Agriculture Senior Officials Committee (part of the COAG framework) for endorsement. The S&G will then require the approval of the Australian Agricultural Ministers (AGMIN) before

⁶ State of NSW (2012)

⁷ World Health Organisation (2015)

⁸ Alsaood et al (2014)

⁹ Voiceless (2015)

¹⁰ Sankoff (2008)

¹¹ Animal Health Australia (2014)

each State and Territory makes the required legislative changes to recognise the S&G as the basis for defining acceptable sheep welfare practice in their jurisdictions.

The various S&G documents replace the current Codes of Practice (CoP) for the Welfare of Animals. The aim of developing the S&G has been to provide:

- *Scientific underpinning of welfare standards.* Some of the provisions of the CoP had some evidentiary basis, while others were based on typical industry practice. The S&G have been developed using the best available scientific information.
- *Greater clarity of acceptable standards.* The CoP use language such as 'should', or 'it is recommended that'. There is a clear delineation in the S&G between Standards which must be observed, and Guidelines that provide additional information but whose observance is not mandatory.
- *Greater legal certainty.* In most – but not all – jurisdictions, including NSW, the CoP have provided a defence against animal cruelty charges but contravention has not been an offence *per se*. The expectation of the new Standards was that they would be compulsory as are the Land Transport Standards in NSW.
- *Harmonisation between jurisdictions.* The CoP are generally similar between States, following a national 'Model Code', but there are some differences, which leads to confusion.

There are few changes in technical provisions between the current CoP and the S&G, so the Sheep S&G should have little immediate impact on most sheep producers in NSW. However, the fact of their development signals the progressive tightening of this aspect of the regulatory environment.

Signals from retailers and consumers on animal welfare

There have been several examples in recent years of food retailers unilaterally adopting particular animal welfare standards as part of their promise to consumers – for example, the HGP-free beef and sow-stall-free pork policies of Coles. Fibre is arguably less vulnerable than food to such disruptions. The domestic food retail environment is dominated by two powerful players, while the apparel trade is much more dispersed and largely overseas-based; 'eating' is a more intimate experience than 'wearing'; and the relationship between 'wool' and 'sheep' is less direct than that between 'lamb chop' and 'sheep'.

The wool industry is not immune to welfare lobby pressure, though. The campaign against the practice of mulesing by People for the Ethical Treatment of Animals (PETA) during the early 2000s caused considerable consternation for the industry as some apparel brands and retailers expressed concern about mulesing even if they did not directly support the PETA campaign. The industry initiated a massive, urgent investment in R&D and associated activities to find alternatives to mulesing and to ensure best practice mulesing while it remained. AWI continues to invest heavily in R&D to replace mulesing with an acceptable alternative for the control of breech flystrike, and in reassuring international partners of these efforts. A renewed attack on mulesing by PETA or other groups, in the near future, is very possible.

The export of livestock is another emotive issue with a number of groups actively campaigning for its closure. For NSW, even though only 11,000 out of over 2 million sheep exported from Australia were attributed to NSW¹², any such ban would likely impact on the sheep industry nationally.

¹² Meat & Livestock Australia (2014)



Other potential welfare ‘vulnerabilities’ (in terms of public perception) for the sheep industry are:

- Other ‘bloody’ procedures: tail docking, castration (pizzle dropping has now been banned in the S&G);
- On-farm mortality rates (notably pre-weaning and during extreme weather events – which are expected to increase in frequency and intensity with climate change);
- Shearing;
- Land transport; and
- Slaughterhouse practices.

It is unlikely that pressure on the industry from welfare activists, governments and consumers to improve welfare practices will abate over the medium to long term. The challenges for the sheep industry will be to: (a) actually improve welfare practices over time, for example through the replacement of aversive husbandry procedures (e.g. immunological vs physical castration) or provision of pain relief where such procedures continue to be required; and (b) gain the trust of the public that producers are adopting the best available welfare practices as they evolve.

New technologies for remote sensing / monitoring of animals to enhance productivity and animal welfare outcomes are already being evaluated and may become increasingly important. These include the use of drone technologies, walk-over-weighing systems, electronic detection of animal health problems (e.g. ‘smelling’ flystrike) and virtual mustering / fencing.

Chemical use

Chemicals continue to form the backbone of the control of sheep parasites which, as described above, are the primary sheep health problems (worms, flies, lice). Chemicals are also used by graziers to manage pastures, weeds and pasture pests.

There are pressures on chemical use in the wool industry, arising from concerns over:

- **Workplace health and safety.** Organophosphate (OP) compounds used in sheep dips and topical blowfly treatments, for example, have been implicated in episodes of ill-health in farm workers. Recently, the OP diazinon was deregistered from use on sheep except by special permit or special application methods.
- **Environment.** For ectoparasite control the industry has largely moved from saturation dips, which generate large volumes of excess fluid, to backline products which remain entirely on the sheep. However, wet dips (on-farm and mobile units) are still used. EPA regulations concerning the disposal of spent dip wash have tightened considerably and require the observation of minimum distances from waterways, bunding of paddocks and periods of nil grazing of disposal sites, among other measures.
- **Market access.** Over the last three decades, the wool industry has prepared itself for potential market access constraints due to chemical residues in exported fleece, especially into Europe. As a result wool chemicals now carry ‘wool harvesting intervals’, minimum periods that must be observed between treatment and shearing.
- **Reduced efficacy due to target organism resistance.** Over time, almost all classes of antiparasitic products decline in efficacy due to the development of resistance by the target organism. Notable examples are organophosphates for blowflies, synthetic pyrethroids for lice and all classes of worm drench.

The industry continues to look for ways to reduce its reliance on chemicals through approaches such as ‘integrated parasite management’ which includes biosecurity to prevent problems such as lice and drench-resistant worms. The industry will need to continue these efforts. It will also need to ensure that chemicals are used safely and in accordance with applicable regulations and market requirements.

Environment

Climate change – biophysical and productivity impacts

The Southern Livestock Adaptation (SLA) 2030 program¹³ formed part of the Climate Change Research Program (CCRP), funded by the Australian Government in partnership with MLA, AWI and Dairy Australia (DA). The program sought to describe climate scenarios in 2030 at a regional level and their potential impact on farm enterprise productivity and profitability, utilising the CSIRO GRASSGRO model and the collective expertise of researchers, extension experts and producers.

Wool production was modelled at eight locations in NSW under each of four climate scenarios. The main results of the modelling are shown in Table 1.

Table 1 Results of modelling of climate change impacts¹ on wool production in eight sites in NSW, conducted as part of the Southern Livestock Adaptation 2030 project

	Rainfall change	Pasture production change	Stocking rate change	Profit change (wool)	Profit change (beef)
Yass	-10%	-7%	-29%	-40%	-61%
Goulburn	-10%	-7%	-25%	-40%	-62%
Cootamundra	-10%	-5%	-17%	-28%	N/A
Grenfell	-5%	-11%	-24%	-51%	-190%
Trangie	-7%	-16%	-10%	-19%	N/A
Temora	-8%	-9%	-13%	-33%	N/A
Glen Innes	-10%	+1%	-6%	-4%	N/A
Narrandera ²	-9%	-23%	-47%	-86%	N/A

Notes on the table:

1. Results shown are an average of the results of four climate models and compare 2030 estimate with 2000-2009 actual data. There was significant variation between the outputs of the individual models, ranging from more drastic outcomes to (in one or two cases) improvements – for example, for Cootamundra, profit change outcomes varied between -66% and +15%
2. Results for Narrandera were noted as needing more work and should be interpreted with caution

The SLA 2030 modelling suggests that climate change will have a significant negative effect on profitability across most regions of NSW. These impacts occur despite apparently small

¹³ Meat & Livestock Australia and Department of Agriculture, Fisheries and Forestry (C'th) (2015)



changes in temperature and rainfall. The regions that are least affected – and may even benefit from a productivity perspective – are those with high rainfall and especially cold winters (above 900m, e.g. Glen Innes), where temperature increases are expected to provide a net increase in pasture production.

The SLA modelling also examined a range of climate change adaptation options and their effect in ameliorating losses in profitability. In many cases these measures do reverse some of the forecast climate-induced losses and even increase profit on current levels, genetic improvement and the use of summer feedlots being the most promising adaptation measures. However, genetic gain is a strategy available *regardless* of climate change, and one that is required for producers to implement simply to address declining terms of trade and remain at baseline profitability – which is not accounted for in the modelling.

The positive news for wool enterprises in the eight regions of NSW modelled is that profitability was less affected than that of beef production. (SLA modelled lamb enterprises in only one of the regions.) The risks associated with cropping, too, are also expected to increase – including, in addition to moisture effects, events such as hail, and frosts around flowering time, which are expected to increase in prevalence. Wool is a less risky enterprise than cropping and climate risk will only increase in future, increasing the attractiveness of wool sheep for broadacre landholders in many areas.

Climate change – regulatory impacts

The other potentially significant impact of climate change on the grazing industries is that exerted by the regulatory response to climate change as Governments attempt to reduce national net carbon emissions.

Australia has a target to reduce greenhouse gas (GHG) emissions to 5% below 2000 levels, or to 25% 'if the world agrees to an ambitious global deal capable of stabilising levels of GHGs in the atmosphere at 450 ppm (parts per million) carbon dioxide equivalent (CO₂-e) or lower', by 2020. By 2050, the target is 80% below 2000 levels¹⁴.

On 1 July 2012, a carbon tax commenced operating in Australia. The fixed carbon price was to be replaced by a cap-and-trade emissions trading scheme on 1 July 2015. Before this could occur, the carbon tax was abolished with effect from 1 July 2014.

The current Government's strategy to meet Australia's emissions reduction targets is its 'Direct Action Plan'. Central to Direct Action is an Emissions Reduction Fund from which Government will purchase emissions reductions through a reverse auction system in which businesses bid to sell the cheapest reductions (\$/tonne of CO₂-e) .

The Fund will also incorporate activities under the Carbon Farming Initiative (CFI) which was commenced under the previous Government. The CFI allows farmers and landholders to earn revenue for undertaking carbon abatement activities – either sequestration (storing carbon in soil or plants) or emissions reductions (for example, reducing livestock emissions). Eligible activities earn Australian Carbon Credit Units, some of which can be claimed nationally as part of Australia's progress towards its targets under the Kyoto Protocol, while the rest are not recognised internationally.

Currently there are very few methodologies (formally-described ways to implement and monitor specific abatement activities and generate carbon credits) available to broadacre producers. It remains to be seen therefore what methodologies will be developed and taken up by woolgrowers. One, which is the subject of much current research, is the opportunity to use genetics to decrease methane emissions via the incorporation of breeding values for this factor into breeding programs. However, selection pressure to reduce methane will come at a cost to gains in other production or quality traits.

¹⁴ Department of the Environment (C'th) (2015)



Other environmental services

Farmers and other landholders are increasingly expected to provide other environmental 'services' to the broader community, such as biodiversity protection and rehabilitation of degraded land. A recent article in the Australian Farm Institute newsletter¹⁵ notes that despite legislation of increasing stringency over the last 20 years, and the locking up of large blocks of land, a number of indicators of Australian environmental health continue to worsen.

In future, the wool industry may require a QA system that vouches for the industry's environmental stewardship (as well as its care for animal welfare, as described above). Different models of funding the provision of environmental services by farmers – in which there is a contribution by taxpayers to recognise the public good delivered – will need to be examined, however, as the current regulation-based approach is neither equitable nor effective.

The NSW Government has recently published a review of the State's biodiversity legislation, prepared for the Office of Environment and Heritage by an independent panel¹⁶ (State of NSW 2014). The review recommends, *inter alia*, the repeal of the Native Vegetation Act 2003 and elements of other legislation and their replacement by a single, integrated Biodiversity Conservation Act.

The Government is yet to respond formally to the review. If it adopts the report's recommendations then the regulatory burden on agricultural producers – arising from State legislation – is expected to be reduced.

Future trends

It appears unlikely that any of the trends described in this paper will be reversed, although the pace of change in each area may vary and plateau at some undefined point in the future.

In regard to **animal welfare**, work undertaken by Meat & Livestock Australia¹⁷ on the social, legal and political landscape for animal welfare has indicated that pressure on these three fronts for improvements to animal welfare will continue. Encouragingly, MLA believes that the bulk of the community wish to continue eating meat and accept the reality of livestock production, provided animals are provided with a comfortable life and die humanely. The implications are presumably similar for wool-producing sheep.

Modelling of future **climate change** indicates (worryingly) that global average temperatures will continue to rise, accompanied by increasing variability of weather conditions as described above. The most likely scenario, therefore, is that policy and regulatory settings will increasingly seek to reduce carbon emissions and assist businesses and individuals to manage the consequences of climate change. A mechanism by which carbon is priced is likely to be an element of this response and this will impact grazing livestock enterprises, although landowners may be presented with attractive alternative options such as income-generating carbon sequestration land uses.

Climate change and the response to it could have positive or negative implications for the wool industry in NSW:

- Climate variability could reduce food production globally, increasing prices for grains and causing cropping to be a preferred land use over sheep or cattle where this is an option.
- In Australia, a price on carbon may make sheep economically unattractive compared with sequestration options such as forestry.

¹⁵ Keogh (2014)

¹⁶ State of NSW (2014)

¹⁷ Some of the background research conducted by MLA in this area is confidential. It has been read by the author but cannot be made publicly available for the purposes of the NSW review



- Alternatively, there could be a move away from fattening livestock or cropping towards wool production as landowners seek to minimise risk.

On balance, the outlook is negative, with the imperative to increase food production and reduce GHG emissions outweighing the benefits offered by sheep.

Potential implications

The major implications for the NSW wool industry and Government arising from forces described in this paper are:

- The importance of managing **biosecurity**. Producers will have to take primary responsibility for the biosecurity of their own flocks. There are important roles to be played by Government, though, to protect the majority of industry from the small number of producers whose actions endanger the health of others' flocks or the health status of the Australian sheep industry. Monitoring diseases and protecting against emerging or exotic diseases is also a critical function. Meat processors can also play an important role in providing feedback to producers on health issues detected at slaughter.
- The need to tackle **predation** in sheep flocks, for reasons of productivity but also social and environmental wellbeing. Government has a responsibility to manage feral animals on Crown land and can also facilitate farmers' access to controls such as baits, as well as coordinating regional control programs.
- The ongoing need for the sheep industry to practise and demonstrate high standards of **animal welfare**. Again, Government has a role to protect the majority from the reckless few by enforcing agreed standards of animal welfare. Adverse publicity from just a small number of individuals will damage the reputation of the whole industry. Over time, the industry will probably need to develop one or more certification programs that assure buyers that ethical production standards have been met.
- The likelihood of negative impacts on wool profit, varying in degree between regions, caused by **climate change**. Regulatory responses to reduce emissions are also likely to have an increasing effect on sheep and cattle graziers in particular because of the significance of enteric methane in national carbon accounts. On the other hand, the increased riskiness of cropping due to climate variability may tilt the balance in mixed farming systems back towards sheep. There will be a need for R&D to provide a greater understanding of the sheep / cropping interface.
- The ongoing pressure for sheep graziers and other landholders to provide other **environmental services** such as biodiversity protection. Again, Government will need to provide a compliance monitoring role in respect to relevant legislation. Importantly, though, there will need to be consideration of how the cost of environmental services should be spread between the private landholder and the Australian taxpayer. Environmental stewardship will also need to form part of an industry QA system.



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