



**Nuffield Farming Scholarships Trust**

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# Farm animal welfare - a voyage of discovery

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## **DISCLAIMER**

*The views expressed in this report are entirely my own and do not necessarily represent the views of the Nuffield Farming Scholarships Trust, or my sponsor, or any other sponsoring body.*

## 1. Introduction

My wife, Sheila, and I have three daughters, Fflur, Siwan and Delun, and live on a tenanted National Trust farm on the Dolaucothi Estate in West Wales. We jointly manage a flock of 620 breeding ewes and produce finished lamb to sell collaboratively with our six fellow tenants on the Estate. I am a trained facilitator and am involved in various off-farm commercial activities that utilise this acquired skill.

I feel immensely proud to have been awarded a Nuffield Farming Scholarship, with the additional honour of receiving the Royal Welsh Agricultural Society Award. I have approached my study with an open mind, and the commitment to share my global voyage experiences with my fellow sheep farmers on my return to Wales.



**My family: Delun, Siwan, Fflur and Sheila**

## 2. Executive Summary

I have always felt the strong need to 'go and see for myself' the welfare practices that are employed by my competitors Down Under, who are clearly masters of exporting their produce all over the world, with high welfare being a key marketing message.

My journey comprised a six week tour of New Zealand and Australia, a Swedish welfare conference, and an opportunistic short tour of Uruguay and Brazil to view beef abattoirs. I was overwhelmed by the help given by the New Zealand, Australian and Uruguayan Governments. Unfortunately, my Brazilian visit was not encouraged by their Government and pre-visit attempts to engage with Government officials on animal welfare were rejected.

The majority of sheep farmers have a natural affinity with their sheep and would identify with Emeritus Professor John Webster's definition of good welfare: that the animal is fit and feeling good. Stockmanship was something that I took great notice of during my travels, as I consider it to determine welfare in all sheep systems. Sheep welfare was the key focus of my research due to my farming background.

The pastoral sheep systems of New Zealand and the dry, arid plains of Australia, with their flock sizes averaging over 2000 ewes, were a complete contrast to the relatively small average flock size of 210 ewes in Wales. Financial necessity requires this scale of operation due to the lack of Government subsidies and the need to cover the costs of production, a global difficulty for sheep farmers.

The shepherd/ewe ratio and the need to maximise the return from their flocks have led to an ewe that can be kept with the minimum of human intervention. The New Zealand sheep farmer especially, views his flock as a single entity and does not have the resources to deal with individual sheep problems. Dystocia and prolapses can go undetected, leading to suffering. Natural culling of problem sheep occurs through mortality, but selective culling is also ruthless, leading to rapid improvement in ease of flock management at critical times such as lambing. Concerning the welfare of the individual ewe, this uncompromising environment and dispassionate approach would at times be unacceptable. Conversely, overall flock welfare could be considered satisfactory.

I concluded that animal welfare is a very abstract subject. It has different value, not only across countries of the world but also within our society in the UK. Measuring 'on farm' welfare is very difficult in a consistent and meaningful way. Fellow stockmen are the best assessors with animal welfare always underpinned by good stockmanship. We should certainly aim for incremental improvement in animal welfare with close links to the market place, as the effect of economics is never far away. As with everything else, animal welfare begins at home, and we should have

the confidence as British producers to continually assess our performance in this area, to improve standards in partnership with the rest of the food chain.

### 3. Background to animal welfare

On my return from agricultural college in 1984 to the family farm, my father gave me some very simple but valuable advice: *'If you look after the sheep in your care, they will look after you and your family'*. On reflection, this was admirable advice which has served me well over last twenty six years that I have been involved in sheep production.

My father was of course alluding to good animal welfare, and having spent all his life as a stockman, had a natural empathy with the animals in his care. He was involved in an industry that was valued for producing food for a generation of people who had experienced the food scarcities of the Second World War, and the post war austerity that followed.

For at least two decades from the 1950s onwards, the drive towards greater food security and a cheap food policy, supported by British Government policy, and latterly by the Common Agricultural Policy, led to the intensification of food production. Concern by Ruth Harrison - argued in her ground-breaking book *Animal Machines* (1964) - led to the Brambell report and the eventual formation of the Farm Animal Welfare Council (FAWC), and the now world-recognised Five Freedoms. I am a current member of FAWC and Chairman of the Ruminants Standing Committee. The 1960s and 70s was also the time of civil liberties, and Peter Singer published *Animal Liberation* in 1974, a book which is widely seen by the animal liberation movement as a clear statement of its philosophical ideas.

Animal welfare is not a new concept and it is on record that discussion about the proper treatment of animals started in Ancient Greece, at the beginning of the 6<sup>th</sup> Century BC. Both Aristotle and Pythagoras set out the main arguments about the relationship between humans and kept animals. Indeed that relationship has been ever changing over the centuries, from animals being worshipped and revered as Gods, providing sport for people (such as bear baiting and cock fighting) to the increasing demand for food from a growing world population and the resulting intensification of food production. Indeed, the UN forecasts that the world population will grow by 50% by 2050 and the demand for milk, eggs and other products from farm animals will double, all to be produced from the same or smaller landmass with an increasing shortage of water.

Legislation about animal welfare has developed significantly over the last two hundred years. In 1809, Lord Erskine stated in Parliament that:

*'Animals are considered as property only: to destroy or abuse them, from malice to the proprietor, or with intention injurious to his interest in them, is criminal; but the animals themselves are without protection; the law regards*

*them not substantively; they have no rights'.*

With incremental improvements along the way, Parliament recently passed The Animal Welfare Act in 2006. This requires that keepers must provide for the basic needs of their animals. FAWC's latest proposal goes even further; they feel the minimum standard of welfare must give farm animals '*a life worth living*', from their point of view. '*The question is not just, "Do they suffer?" nor, "Are their needs met?" but rather, "Do they have a life worth living?"*' The Farm Animal Welfare Council, 2010.

Any discussion around animal welfare can only be carried out by also taking into consideration current phenomena, such as global warming, increasing world population, and the turmoil in world economics. Animal welfare is increasingly a global issue, creating tensions within such bodies as the World Trade Organisation (WTO), which has to balance free trade of food with the vast differences in animal welfare standards across the world. The emergence of private farm assurance schemes such as the Red Tractor and Freedom Food in the United Kingdom has led to accusations of protectionism that limits market access to produce from third world countries.



## **4. Countries visited on my Nuffield Study Tour**

### **a) Sweden**

I travelled to Sweden to attend The Welfare Quality© (WQ) Conference at Uppsalla. The conference did not disappoint, and confirmed the fact that animal welfare is very high up the European political agenda. Sweden currently holds the Presidency of the European Union and prides itself on a positive track record within the field of animal welfare. The opening statements were made by the Swedish Minister for Agriculture and the EU Commissioner for DG Health and Consumers. The seniority of these speakers was not surprising when you consider that this was the closing meeting of a seven year project that has cost 20 million Euros.

The WQ project has worked with three species: cattle, pigs and poultry. Sheep were not included due to the perceived lack of welfare problems and also the low numbers of sheep being farmed within the EU (the UK being the exception). The project brought together animal and social scientists in a quest to find a solution that delivered on consumer demands on animal welfare, but that was also achievable, measurable and had positive cost benefits on farm.

### **b) New Zealand**

I knew that I was on the other side of the world when a New Zealand sheep farmer seemed at a loss when I asked how often he updated his flock register. I was quickly told that the only legal requirement regarding sheep numbers was to keep his accountant updated at the end of the year for valuations and tax. That set the scene for my introduction to a deregulated, unsubsidised, customer-focused industry, with the continuous challenge of exporting 90% of its produce to the far ends of the Earth.

Financial necessity has resulted in much larger farms in New Zealand compared to the UK. I was struck by the continuous quest to match the ewe to the environment through genetics and selective culling with minimal human intervention, especially at critical times such as lambing.

I met many commercial and pedigree sheep producers, processors, legislators and scientists and was gratified by their openness and eagerness to exchange information on the many thorny topics of sheep farming, especially welfare.

Comparisons between welfare in such different farming systems are difficult to make yet our countries share a common drive for incremental improvements in sheep welfare through research and development (R&D), education and regulatory enforcement. The New Zealand Ministry of Agriculture and Forestry (MAF) Animal Welfare team impressed me with their professionalism, knowledge and commitment

to drive welfare policy within New Zealand, with timely, credible advice on welfare standards and codes provided by the National Animal Welfare Committee (NAWAC).

The New Zealand research capability was notable; AgResearch and Universities such as Massey are leading in welfare research. Education and technology transfer were commonplace ways of improving animal welfare, with the carrot ruling the stick. Implementation of Government and commercial policies on the farm must be measured if progress is to be certain. However, I was left with some concerns about the evidence available to support the claims made by New Zealand officials and farmers in relation to on farm welfare surveillance and enforcement.

The influence of UK retailers on farm assurance programmes used by New Zealand export processors was evident. The lack of a national farm assurance scheme resulted in a plethora of individual processor initiatives and was at times confusing.

### c) Australia

Australia faces many challenges when it comes to animal health and welfare:

- climate change which will increase the risk of drought
- increasing temperatures having an effect on the location pests and diseases
- significantly, the human element of each state having its own Welfare Act.

In an attempt to bring a national approach to welfare the Australian Animal Welfare Strategy was launched in 2004, and has been continually revised with stakeholder engagement.

Australian lamb tends to be imported into the UK as a catering product and is often what you might be offered in some of our restaurants. My key areas of interest during my visit was the issue of mulesing (the removal of strips of wool-bearing skin from around the breech of a lamb to prevent fly strike), and the live export trade of sheep to countries such as Kuwait and Saudi Arabia.

An insight into the lamb processing business in Australia was achieved with a visit to lamb processor Fletcher International Exports. The company specialises in utilising all the sheep and lamb processed, including the wool which is cleaned and treated to the stage where it can be directly exported to places such as China, to be manufactured into the clothes we buy on our high streets.

### d) Uruguay

My brief visit to Uruguay was as a guest of Terry Johnson, a Cornish gentleman with an unprecedented track record in meat processing. He has previously operated in the UK, Australia, Brazil and Argentina, but believes that Uruguay is the ideal country where he can satisfy his vision for a fully traceable, competitive, high quality beef product through an integrated supply chain. He is backing this challenge with 150

million US dollars of investment in a new factory, company farms to demonstrate best practice, dedicated farm assurance scheme and a producer club.

Uruguay is justifiably referred to as a large agricultural estate where over 87 percent of the land is used for cattle production and has the highest ratio of cattle/people in the world (3.7 head/person). The natural grasslands are used for extensive beef production with each animal having 15,000m<sup>2</sup> of space, which is the equivalent of two football fields.

Uruguay is third in a World Environmental ranking that considers 146 countries and is one of the 5 countries recognised as 'countries with a negligible BSE risk' by the World Organisation for Animal Health (OIE). Traceability, always an issue with South American beef, was impressive, with a National Identification Scheme in place based on EID. Meetings were held with Uruguayan Government officials arranged with the full cooperation of the Uruguayan Embassy in London.

## **e) Brazil**

My visit to Brazil to study their beef systems was not welcomed by the Brazilian Government and pre-visit attempts to engage with Government officials on animal welfare issues while I was in Brazil were rejected – much to my frustration, and that of the amicable Brazilian Embassy staff in London.

There is more than 170 million Ha of pasture in Brazil with a population, coincidentally, of 170 million beef cattle. They produce 13% of the world's beef and 28% of global beef exports. Production has increased by 25% in the last nine years, much of it in the nine states of the Legal Amazon where the expansion of pasture land and cattle production is identified as the key driver of deforestation. It is with this controversial background and accusations of deforestation, poor record on traceability and worker exploitation that I undertook a short tour of two EU approved beef processing plants and a large beef and arable farm owned by the Damha family.

My visit was based in the Sao Paulo region where the re-establishment of the valuable EU export market is being launched from newly approved farms, modern slaughter houses and states that have a longer period of foot and mouth disease free status.

## **5. Animal welfare legislation**

### **a) United Kingdom**

These days, much of UK legislation emanates from the EU. European legislation relating to welfare of sheep consists of the Council of Europe conventions on animal welfare, e.g. the Convention for Protection of Farmed Animals (ETS 87 1976), as amended (ETS 193 1992), which was translated into EU law by Directive 98/58/EEC. These and other EU laws make provision for the essential needs of animals in both intensive and extensively farmed systems. They place obligations on animal keepers to comply with and to promote animal welfare and on Competent Authorities to enforce standards through inspection. Additional controls exist to protect animal welfare during transport and slaughter. Regulation 882/2004/EC requires Competent Authorities to undertake Official Controls to check compliance with Community rules and report these checks to the European Commission. In addition to the usual enforcement measures and penalties, failure of sheep keepers to meet Community rules, including welfare, can result in a reduction of payments made under various Common Agricultural Policy (CAP) schemes. There are also independent EU checks on Member State compliance through the Food and Veterinary Office.

In England and Wales, the welfare of sheep is protected by the Animal Welfare Act 2006 (with similar legislation in Scotland). It is an offence to cause unnecessary suffering or to fail to provide for an animal's needs and there is an implied duty of care. These general provisions are supplemented by detailed requirements set out in the Welfare of Farmed Animal Regulations for each country. The Welfare Code for sheep covers these legal requirements and contains advice for farmers and shepherds on best husbandry practices. The Code also incorporates FAWC's advice as well as the detailed provisions of the Council of Europe's recommendation on the welfare of sheep, 1992.

The welfare of sheep is also protected by other legislation and guidance covering transport, markets and during slaughter and killing, movements, identification, mutilations, veterinary medicines and feedstuffs.

### **b) New Zealand**

The Animal Welfare Act 1999 in New Zealand requires all owners and people in charge of animals to meet the physical, health and behavioural needs of their stock. This means providing animals with appropriate food, water and shelter, handling them appropriately, providing them with an opportunity to display normal patterns of behaviour and avoiding or treating injury and disease. These requirements are very similar to those in the UK. The Act does not provide the detail of what these needs are or how they should be met for each species or situation. This detail is given in the Codes of Welfare, which may be species-specific (e.g. sheep and beef

cattle) or focussed on procedures (e.g. transport or commercial slaughter). These Codes are drawn up by the industry (or others) and approved by Government on the recommendation of the National Animal Welfare Advisory Committee, NAWAC, which is a similar body to FAWC.

The minimum standards in the Codes of Welfare must be met to comply with the Act. Breaching a minimum standard is not an offence, but can be used as evidence under the Act (e.g. failing to provide water or food). Equally, if a minimum standard is met, this can be used in a keeper's defence if prosecuted for an offence. A breach of a minimum standard can indicate that someone has committed an offence. The legal status of the Welfare Code in New Zealand is similar to that in the UK.

### **c) Australia**

Under the federal structure, responsibility for animal welfare legislation resides with the Australian States and Territories rather than the Commonwealth. The Primary Industries Ministerial Council has developed Model Codes of Practice for the Welfare of Animals that contain detailed requirements to deliver sound animal welfare outcomes for livestock throughout Australia. A national system of directly enforceable standards for animal welfare in each of the livestock industries is being developed to replace the national Model Codes. The intention is to implement these standards consistently in each State and Territory.

The statutory requirements relating to sheep welfare are broadly similar in the UK, New Zealand and Australia. However, there are some mutilations, such as mulesing, that are currently allowed abroad but which are prohibited in UK. In addition, in the UK there is a statutory EU obligation on Competent Authorities to have in place a system of surveillance and official controls for welfare on farm, during transport and at slaughter to check the implementation of welfare laws.

## 6. Farm visits

### a) New Zealand

#### (i) Mt Linton

Ceri Lewis was one of my fellow students at the Welsh Agricultural College in the 1980s. On finishing his education, he very quickly moved to New Zealand, and is now the successful General Manager of Mount Linton. I thought I had a good insight into the scale of the farming operation and Ceri's achievement, from Dai Jones's S4C television program last year. However, what I experienced during an extensive tour of the farm, which is braided by 300km of gradable road, and covers in excess of 32,000 acres, (13,000 Ha+) was difficult to comprehend. Over a period of four hours we drove continually around different areas of the farm taking in the scale of the operation.

Ceri has split the station into separate blocks and delegated responsibility to various managers. This of course encourages competition and allows benchmarking of progress. Each block might hold 6000 ewes with their lambs at foot and one person was expected to be in sole charge of the work for most of the year, but getting collective assistance at dosing, tailing and other key husbandry events.



**Multiple husbandry tasks being carried out on Mt Linton lambs**



Contractors are used to shear, and we experienced a gang of men tail docking, orff vaccinating, dosing and ear marking while we were on one of the outlying hills. The speed of the operation was impressive, but some of the techniques used might be called into question under our welfare guidelines in the UK. Short tail docking was certainly an issue.

We are taking part in a sheep lameness trial on the farm at home, as we do have a problem with lame sheep, probably made worse by our housing of the flock during a three month period in the winter. In New Zealand I did not encounter many lame sheep because they had a very practical solution. Feeding 120 Huntaway and heading dogs requiring 40 carcasses a week can lead to a very practical approach to lameness control. The routine culling of any lame ewes effectively reduces the risk of cross infection, the presence of long term lameness in individual ewes experiencing pain and distress, and genetic improvement being moved swiftly along.



**Lameness control New Zealand style - 120 Huntaway and heading dogs requiring 40 carcasses per week as feed**

An aggressive program of land improvement is carried out on the natural hill country with about 1200 Ha being tackled every year. This involves a two year program of spraying, burning and planting roots under sown with short term grasses before the ground settles down into long term leys. Nearly all the work is done by helicopter. The significant investment allows around 6000 extra ewes to be kept every 24 months. Ceri and his genetics manager Hamish Bielski form a formidable team with

regard to the cattle and sheep genetic programs. Mount Linton is increasingly being seen as a key source of quality rams and bulls with clients throughout New Zealand returning on a regular basis.

We left Ceri and his family having had a fantastic insight into a large scale farming operation being run with vision, hard work and top level management.

**Key facts:**

**Area:** 3850Ha Downs, 2450Ha Developed Hill Country, 4715Ha Over sown tussock country, 2050Ha Native Tussock Country, 300 Ha Radiata pine plantations.

**Stock numbers wintered 2009:** 43,000 Romney, Texel, and Perendale – cross ewes, 11,000 ewe lambs, 1900 Angus cows, and various other calves, bulls, finishing heifers which come to a grand total of 84,340 stock units. (A further 1200 recorded ewes make up the sheep genetics unit which is run as a totally separate unit)

**Sales in 2009:** 253,000kg of greasy wool, 59,000 finished lambs, 1680 head of cattle, 300 Texel and Suftex rams, and 300 Angus bulls.

**Winter feed:** 450Ha \_swedes, 360 Ha turnips as part of the 1st year development on reclaimed hill, and 300 Ha Moata on the second year of development. 1200t silage and 950 big bales of hay.

**Dogs:** 120 Huntaway and heading dogs requiring 40 carcasses/week as feed

**Fencing:** 1000km of fencing

**Shelterbelts:** 60km of planting

**Annual Fertiliser:** 2750t + lime

**(ii) Te Mania Aberdeen Angus Stud**

The Te Mania Angus Stud is owned by the Wilding family and managed by John Harrington, the driving force behind the continual progression of the Te Mania herd. Te Mania was founded in 1928 and. four generations of Wildings later, the stud has grown from four cows to 1070 registered females (cows and heifers). In 1971 a sister stud, Te Mania Australia, was established by a close family member, and the Te Mania Angus stud, with 2600 fully performance recorded registered Angus females is probably the largest in Australasia.

The farm has an area of 5000 acres ( $\frac{2}{3}$  owned,  $\frac{1}{3}$  leased) with land ranging from the wave breaking coast, to the rolling hills behind, which went up to 500 feet above sea



level. Rainfall is around 1000mm/annum, with irrigation possible on about 600 acres of the bottom ground. Three full time staff and a student are employed, with owner Tim Wilding mainly working away from the farm developing the Te Mania brand and a fully integrated supply chain in conjunction with key processor and retailing partners.

The trip around the farm was inspirational: from the quality of the pastures which are soil tested regularly to ensure that the phosphate, sulphur and pH levels are at their optimum, to the consistent quality of the cows and calves which were set stocked around the farm in groups of around 75 cows. John explained that the heifers undergo a synchronised mating program at around 13 to 14 months, and any animal that does not calve down at 2 years old is culled. The same tight breeding policy is adopted for the cows. Five or six had needed assistance at calving during the season and they would be culled as a matter of course.



**Te Mania Angus Cows and Calves**

The policy was to achieve a low calf birth weight, with a target weaning weight of 180Kg at four months old for the bull calves. Any male calves not getting near this target are castrated. The four hundred day target weight is 400 kg off grass. Beef genetics is certainly not one of my areas of expertise by any measure, and it was new to me that the scrotal size of a bull has a direct correlation to heifer puberty. The cattle are out all year round, but a percentage of the farm is put down to kale and whole crop silage each year to ensure a buffer feed if needed during a period grass shortage.

Health treatments are kept to a minimum, with drenches used rarely on heifers, (not on cows) and 10 in 1 vaccination with leptospirosis and lice 'pour on' administered to all the cattle. The farm veterinary surgeon visits the farm on a consultative basis once a month. The bulls are sold either as yearlings (46 bulls @ 2800NZ\$) or later at 22 months in the main stud sale. (113 bulls @ 6250NZ\$) The Angus cattle I saw in Te Mania were of smaller stature than the ones I have seen in the UK but were ideally suited to the environment in which they are kept.

John's mission statement is *'to breed very sound, high fertile cattle with calving ease and high growth rate, and emphasis on carcass quality to assist our clients in meeting strict market specifications'*. He was convinced that his current star bull Te Mania Infinity would do exactly this job and they would all be millionaires next year. John came over like many other beef and sheep breeders I have met, with a passion for his work and the balance of expert stockmanship and scientific knowledge to support his genetic improvement work on the Te Mania Angus breedline. Animal welfare was a by-product of excellent stockmanship and first class breeding practices.

## **(b) Australia**

### **(i) Greenthorpe**

Julie Brien is a fellow Nuffield Scholar and it was a happy reunion as she had stayed with us in Wales during the Royal Welsh Agricultural Show and the UK part of her Nuffield study. We had also travelled together with all the 2009 Nuffield Scholars from all over the world in early spring from London, through France to Brussels. Julie manages 2100 acres jointly with her parents and brother, David. The farm consists of 1000 acres of cropping and 1100 acres of pasture which stocks 1000 ewes with a lamb weaning percentage of 148%. Lambs are weaned at 12 weeks onto lucerne, followed by wheat stubble and eventually supplemented by grain and silage as the summer heat takes all the green cover and turns the area into a yellow flat plain.

*See picture overleaf*



**Ewes on stubble in Eastern Australia**

Julie has overall responsibility for the ewe flock and aims to sell all the male lambs at an average carcass weight of 23kg. All the ewe lambs that reach a target live weight of 45kg are put to the ram, with the empty lambs at scanning often being sold at a carcass weight of 30kg. Julie sells these lambs to an abattoir that does not penalize on fat but just pays on weight. Julie has experimented with a number of breeds including Coopworth, Corriedale, Finn and East Friesland. She covers the ewes with a Dorset Ram. Footrot has been eradicated in the area, and is a notifiable disease. With around 20 inches of rain annually, there is at least one advantage to the dry conditions. One of the key welfare challenges her farm has to overcome are spring storms with the resulting high lamb losses. Julie's Nuffield studies are based around lamb mortality.

## 7. Observations on the welfare of the ewe and lamb on farms in New Zealand and Australia

The pastoral sheep systems of New Zealand and the dry, arid plains of Australia, with their flock sizes averaging over 2000 ewes, were a complete contrast to the relatively small average flock size of 210 ewes in Wales. Financial necessity requires this scale of operation due to the lack of Government subsidies and the need to cover the costs of production, seemingly a global difficulty for sheep farmers.

The shepherd/ewe ratio and the need to maximise the return from their flocks have led to an ewe that can be kept with the minimum of human intervention. The New Zealand sheep farmer especially, views his flock as a single entity and does not have the resources to deal with individual sheep problems. Dystocia and prolapses can go undetected, leading to suffering. Natural culling of problem sheep occurs through mortality, but selective culling is also ruthless, leading to rapid improvement in ease of flock management at critical times such as lambing. Concerning the welfare of the individual ewe, this uncompromising environment and dispassionate approach would at times be unacceptable. Conversely, overall flock welfare would be satisfactory and pass FAWC's 'life worth living' definition of welfare.

I visited many farms and found lameness a rarity, while it is a common problem in the UK. The solution on-farm was to slaughter any lame sheep to use as dog food, thus removing the problem and risk of spreading infection. Successful foot rot eradication programmes in Western Australia and New South Wales have been assisted by the dry conditions.

Surprise was expressed that I bought my rams on phenotype alone and that the sire reference schemes and breeding programs encouraged by levy bodies such as Hybu Cig Cymru (HCC) were in decline. I found all ram breeders used records to justify their breeding policy, with customers having the confidence to buy on e-mailed records alone. The aim was the *maximum amount of kg of lamb produced/Ha with the least cost and intervention*. New Zealand farmers maximised the use of grass during the growing season, with root crops the diet during winter. A mixed livestock/arable system to combat the increasing threat of drought would often be employed in Australia.

Significant variance in climate, topography, social and cultural attitudes dictates that best practice cannot always be transported across continents. It became very clear to me, however, that parochialism present amongst some UK beef and sheep breed societies limits advances in animal welfare due to aesthetics taking precedence over breeding a natural, functional and low maintenance animal.

The care of the individual ewe, possibility of heavy neonatal mortality, and the lack of official on-farm surveillance to identify poor welfare at an early stage are key weaknesses within the New Zealand sheep industry. Mulesling, transportation over large distances to slaughter, and the live export trade are contentious issues in Australia.



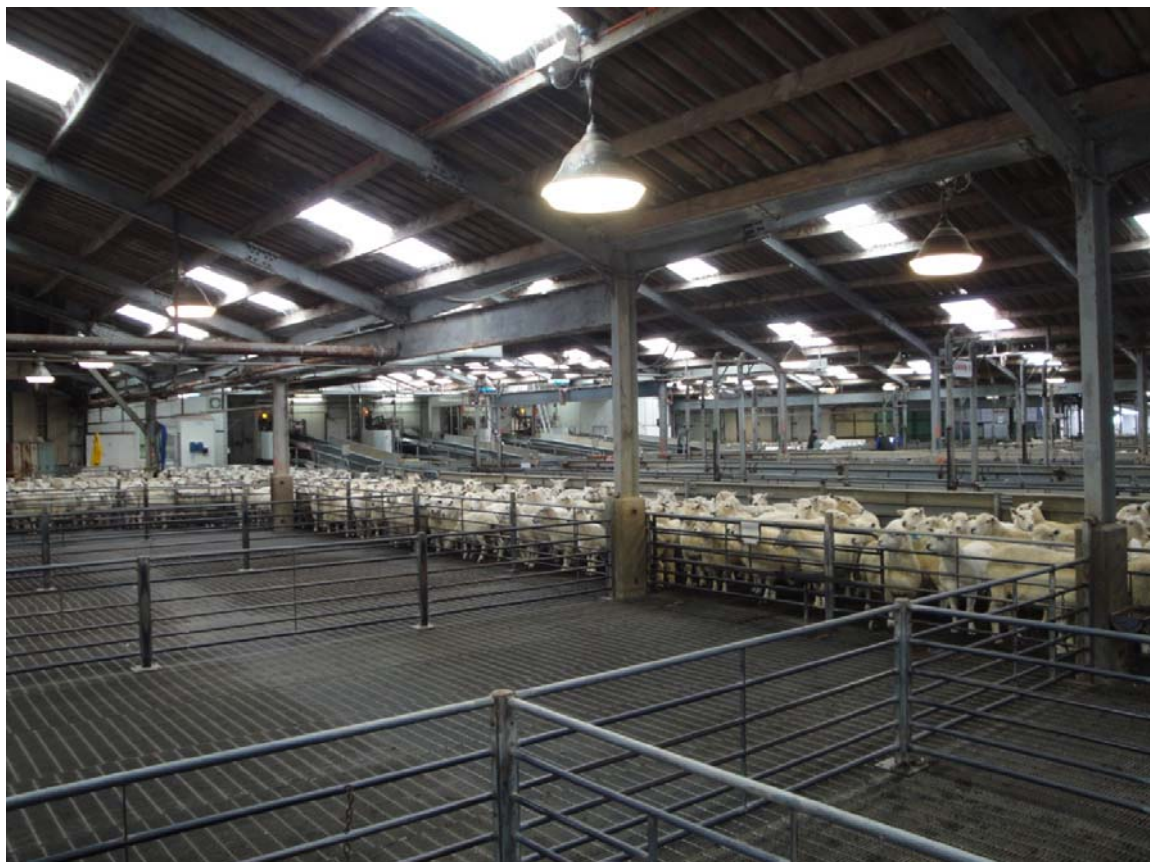
## 8. Processing Plants

### (a) New Zealand

#### (i) Lorneville Plant

Lorneville is a plant that can slaughter up to 28,000 lambs per day, and further process 85% of those carcasses. This is the reason I travelled to the Lorneville processing plant at Invercargill. The plant is part of the Alliance Group, a large farmer owned and operated cooperative which processes lamb, beef and venison.

The plant's throughput is impressive by any standards and runs two shifts over a 24 hour period. Four chains are operational during every shift with the capacity to handle up to 4000 carcasses per chain. The number of operational chains may vary during the season. I was met by the Plant Manager, Mr David Kean, who very kindly took it upon himself to dedicate the day to showing me around the plant and introducing me to his various managers along the slaughtering and processing chain. David is a production guy who has moved progressively up the ladder at the plant over a number of years, and it was very noticeable the quiet respect he received from his colleagues as we toured the plant.



**Lairage at Lorneville lamb processing plant**

Ceri Lewis, the manager of Mount Linton station had driven up from Ohai to join us for the day. At the height of the season Ceri supplies around 4000 lambs per week into Lorneville.

I knew that Alliance supplied many of the leading retailers in the UK with lamb, and I was given a briefing by Gary Maclellan, Development Services Manager, who is responsible for farm assurance and supply chain development. It became very clear that foreign importers drive the agenda of many of the aspects related to transparency and accountability within the supply chain. Gary's role is to manage these demands, educate and enlighten foreign buyers on the farming systems within New Zealand, and encourage his lamb suppliers to embrace change when necessary to protect market access – a challenging role. I found the conversation transparent, and supported by documentation which I could take away and study at my leisure.

Only chain No1 was working on the day due to the early season, and it was noticeable that this senior chain had an equally 'senior' average age. I was told that some of the workers were in their late sixties and promotion to this line was nearly a case of 'filling dead men's shoes'. The development of robotic pullers at various stages of the carcass dressing had alleviated some of the hard work on the line, and allowed the senior workers to carry on into old age.

We were given a tour around the boning and processing halls, with each department manager taking their turn in briefing me about what was going on at each stage, as the carcass was turned into shoulder rolls for Japan, or racks of lamb for the European market. I am a great believer that every sheep farmer should visit his local processor to follow the lamb through from slaughter to the final cuts and packaging. It is a complex operation.

I finished the visit with a tour of the lairage, where 28,000 lambs could be held at any one time. The lambs were shampooed as they entered the lairage, and then water sprayed in a large round pen. The plant had done away with the swim bath which I saw in the Silver Fern Farms abattoir earlier on my trip. This washing process is justified on hygiene grounds, and the need to maximise shelf life in some of New Zealand's far flung markets around the world, but other options are being considered. Some very well trained Huntaway dogs helped move the lambs once they were unloaded from the delivery trucks. The abattoir staff expressed concern that some retailers had banned the use of dogs in lairage pens, which would cause difficulty in an operation of this magnitude. The dogs seemed to bark on command, shut up on command, and brought home to me how badly trained and controlled my Huntaway is at home on Llandre.

## **(b) Australia**

### **(i) Dubbo Plant**

I flew to Dubbo to meet with an iconic Australian called Roger Fletcher who started life as a sheep shearer and drover and is now the owner of Fletcher International Exports. The company is a sheep and lamb processor, and through the plant in

Dubbo, and a sister plant in Western Australia, has a combined processing capacity of 4.5 million head per year. The company specialises in utilising all the sheep and lamb processed, including the wool which is cleaned and treated before being exported. The company has customers in 90 countries.



**Roger Fletcher and Adam Hughes of Fletcher International Exports**

My visit started with an introduction to the plant by Colin Plant, the production manager who was originally from Northern Ireland and Adam Hughes, the Quality Assurance Manager. The plant could process 8500 sheep and lambs per day using one chain and running two shifts. In addition to the cold boning rooms which I was used to seeing in the other plants that we had visited, a hot boning room was used, and a proportion of the sheep could be slaughtered and processed within two hours.

The plant lairage was covered and held 4000 head at one time. Muzzled dogs were used in the pens, and also to unload the lorries as they arrived. The lorry drivers had their own dogs which travelled in compartments underneath the trailers. All the sheep were tagged, identifying the farm of origin, and arrived clean. We were in an area that was suffering from severe drought and scorching temperatures averaging above 30°C. Due to the large distances involved in any travel in Australia, the sheep could be transported for 48 hours without unloading, and incredibly there was no requirement for water or fans to be installed on the trucks which surely must have detrimental welfare implications for the sheep.





**Huntaway dogs in the Fletcher International Exports lairage**



**Adam Hughes showing me the end product from the wool processing process**

The tour of the wool processing factory was fascinating. The wool is first removed from the pelt by a chemical process, and by scouring, (washing) combing and sorting, the long fibres are isolated and ready for spinning. The mechanisation and sheer distance involved from start to finish with this process needs to be seen to be appreciated. As with the other plants that we had visited we were given a very informative and lengthy tour with permission to take pictures – which is not always the case in UK plants.

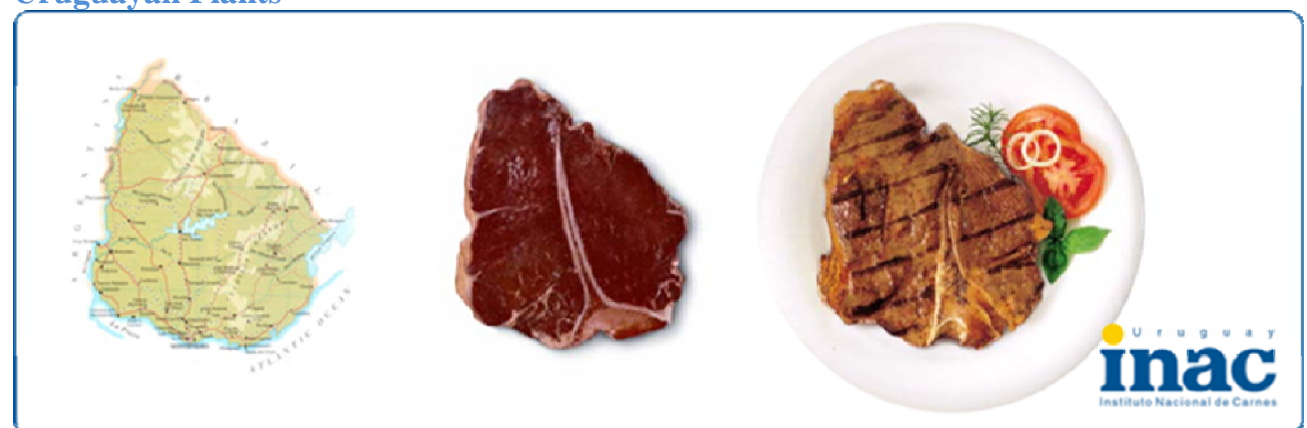
My conversation with Roger Fletcher was entertaining, informative, challenging, and totally absorbing - as you would expect with a man of his stature within the Australian sheep farming and processing industry. I felt very privileged that he was so generous with his time during our meeting, and I can still see the glint in his eye as he recounted driving 5000 sheep around 900 miles on foot across the outback. I asked him how many sheep he had lost on that journey, and the immediate answer was that you usually finished off with more than you had started with!

Roger was very concerned about declining sheep numbers in Australia, which made procurement increasingly difficult. The key policy within his business was to seek efficiencies, and utilise and add value to every part of the carcass. It was alleged that he even tried to market the 'Bah' in sheep!! The issue of live exports was discussed at length and in no uncertain terms as he disagreed vehemently with the trade on animal welfare grounds.

### c) South American Plants

I visited abattoirs that exported beef and lamb to the UK. I found the Brazilian and Uruguayan plants to be completely focussed on the individual requirements of their global customers. The positive influence on animal welfare as a result of UK retailers putting commercial pressure on their foreign abattoir operators was evident, with efforts being made to reach certain standards throughout the food chain.

#### Uruguayan Plants



Any country that has a shape that can be used to market its beef steaks must have something going for it and does not take long for an entrepreneur to see the potential marketing advantages. I would imagine that everyone meets an individual

during their study who makes a great impression on them. In my case it was Terry Johnson, a man with a vision who sees Uruguay as a country where you can develop the most robust and traceable beef supply chain in the world. This would deliver a unique quality beef product through a comprehensive, vertically integrated supply chain. He has invested 150 million dollars in farms to demonstrate best practice, producer clubs to empower farmers, and a brand new plant that can process 2000 animals a day with a handling system designed by Temple Grandin.

Uruguay is the 7th largest beef exporter in the world. Breeds are mainly Hereford and Angus with 70% of beef production exported. So why did Terry Johnson chose Uruguay as a place to invest his money and energy?

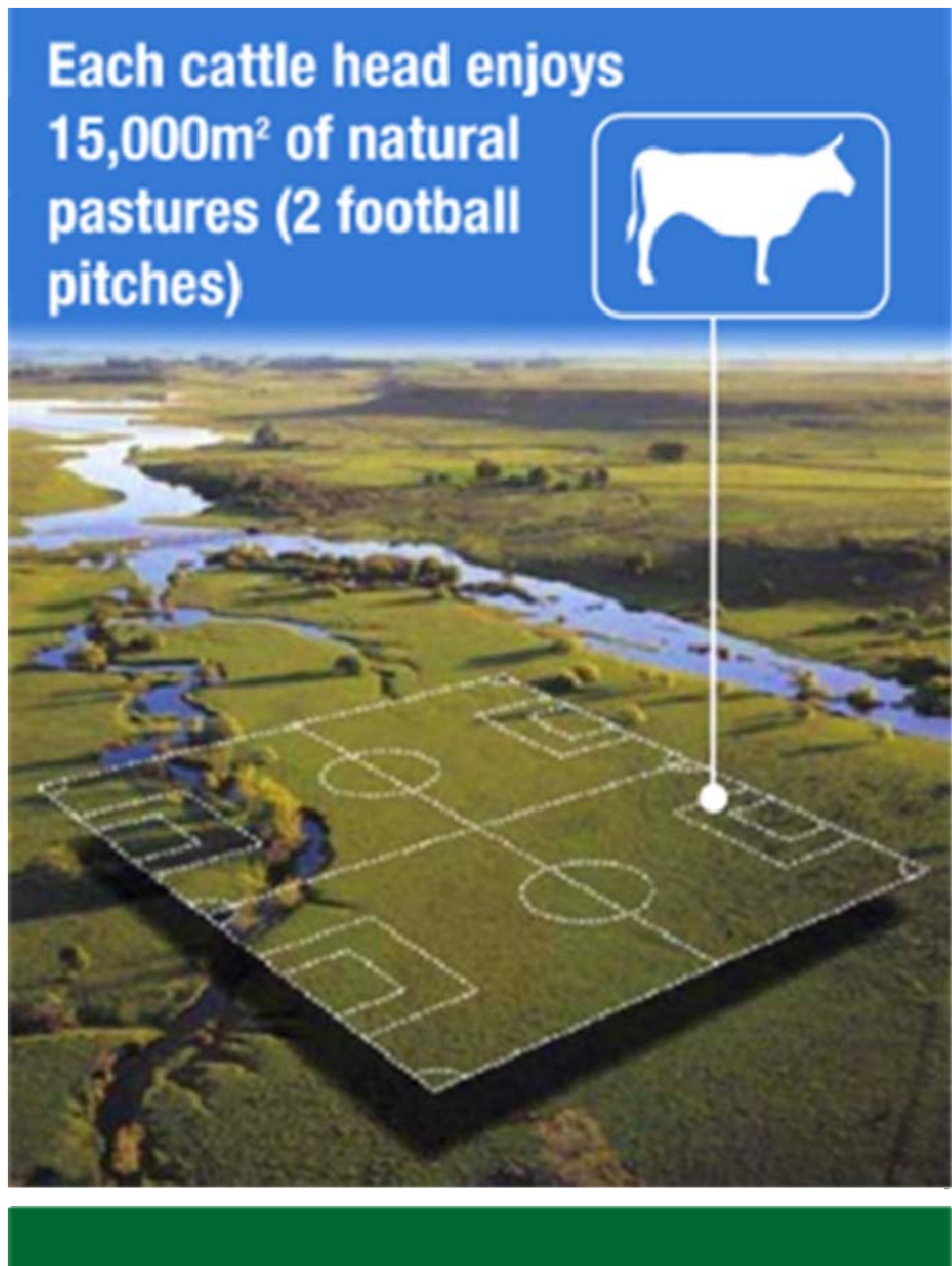
- Uruguay is politically and economically stable.
- A positive attitude to beef production investment.
- A positive livestock health status.
- No use of growth hormones (banned).
- No use of animal feed protein (banned).
- FMD free.

Conversely the main welfare challenges facing the industry in Uruguay are: an inadequate road infrastructure and poor transport, on farm mutilations such as dehorning and castration, and the increasing risk of drought.

Uruguay is sometimes referred to as one large estate with 84% natural pasture. The country is ranked 3rd in the world environmentally in a table that that considers 146 countries.



This promotional picture produced by the Uruguayan National Meat Institute (INAC) is a great exponent of the naturalness of Uruguay's beef production.



## 9. Observations on processing plants

All the abattoirs I visited either supplied products into the UK retailers or had aspirations in that direction. The result was that they were extremely receptive to retailers' demands; therefore UK welfare requirements were imposed on their suppliers. They viewed the European market as the choice destination for their high value cuts although new markets are emerging in the Far East due to the economic growth in those regions.

Lairages were designed to ensure the smooth flow of animals, with the influence of Temple Grandin and Michelle Waterman (ex Tesco Agriculturalist) evident in many cases, no more so than in Terry Johnson's super plant in Uruguay. The use of flags by drovers to drive beef animals was also an innovative and positive welfare practice in Brazil and Uruguay.



**Lairage at Terry Johnson's beef processing plant in Uruguay**

Contentious issues in some plants in New Zealand included the need to wash lambs prior to slaughter to ensure cleanliness which affects shelf life of the product. I was not impressed with the process and the lambs were obviously stressed by the experience. The use of dogs in New Zealand and Australian plants is also widespread



to ensure the movement of lambs within the lairages. Some UK retailers are considering the banning of this practice. I am not sure how a plant like Lorneville in Invercargill could cope with 28,000 lambs per day without the use of well trained and muzzled dogs and it could lead to frustrated drovers with counterproductive consequences.



**Lamb washing at a New Zealand lamb processing plant**

The Australian ewe flock has dropped from 170 million to 70 million resulting in the closure of many abattoirs which has increased the travelling distance for many animals. (I have already expressed concerns on the rules governing the transport of sheep in Australia). The live export trade plays a key role within the Australian lamb industry, and is without doubt underpinning the national lamb price. The live export trade is extremely controversial with lambs being delivered live to the Middle East countries where welfare standards can be very low especially at the point of slaughter. Peta and other animal right organisations have heavily targeting this trade resulting in better ships. Live Corp is now positively engaging in improving animal welfare practices on the ground in the Gulf States by introducing basic stockmanship and animal handling skills (starting from a very low base according to our standards, but effectively encouraging incremental improvement over time). Significant investment in a public relations exercise has been undertaken to make the trade appear acceptable.

New Zealand has recently led the way with a new Animal Welfare (Commercial Slaughter) Code which has banned kosher slaughtering by requiring that all animals slaughtered commercially be stunned prior to killing. The majority of lambs slaughtered in the UK are pre-stunned before the animal's throat is cut and historic data published by the Meat Hygiene Service suggests that around 90% of UK halal slaughter involves pre-stunning. New Zealand's stance on this contentious issue should be noted and complimented.

## **10. Does being part of a recognised brand encourage better welfare, and how do we qualify and measure the 'high welfare' claim?**

Farm Assurance is a tool used by the food chain to gain market access and to give retailers the confidence that the produce they sell to their consumers is both safe and produced to agreed acceptable standards. Assured Food Standards (owners of the Red Tractor scheme) are independent organisations in the UK who run Assured British Meat (ABM) which leads to the individual scheme in Wales covering beef and lamb called Farm Assured Welsh Livestock (FAWL). Freedom Food, the RSPCA supported scheme, is also gaining ground in Wales as it is perceived to concentrate to a greater extent on welfare.

In the case of lamb imported from New Zealand, individual retailers tend to use different private schemes. Lambs processed by plants that supply into Sainsbury's are accredited by accreditation authority JAS-ANZ. The body that carries out inspections is AsureQuality, which was born from the 2007 merging of ASURE New Zealand and AgriQuality. These parent bodies were established out of the commercial activities of New Zealand's Ministry of Agriculture and Forestry (MAF). The accreditation is based on the welfare standards laid out in the Minimum Standards of the Public Draft of the Animal Welfare (Sheep & Beef Cattle) Code of Welfare, published by the NAWAC.

I travelled to Sweden to attend the Welfare Quality© (WQ) conference. The two day conference was the closing meeting of a seven year project that has cost 20 million Euros involving animal and social scientists.

There is a shift away from measuring welfare inputs (trough space, lying area) and the project was a quest to satisfy consumer demands about animal welfare in a way that was achievable and had positive cost benefits on the farm. Much work had been done on animal based measures which could be scored but proposals on practical methods of implementation within realistic time frames on farm was lacking. Maybe it is a case of the scientists delivering on the research and leaving it to chance whether anything else happens! Justifiable comments were made on the danger of just another scheme, another inspection and more regulation.

Welsh lamb, New Zealand lamb, and other national brands, all have their separate identities that are spun by various marketing strategies. Claims to good welfare are made, but how do the other partners in the food chain, and ultimately the consumer have the confidence that even the minimum welfare standards are met?

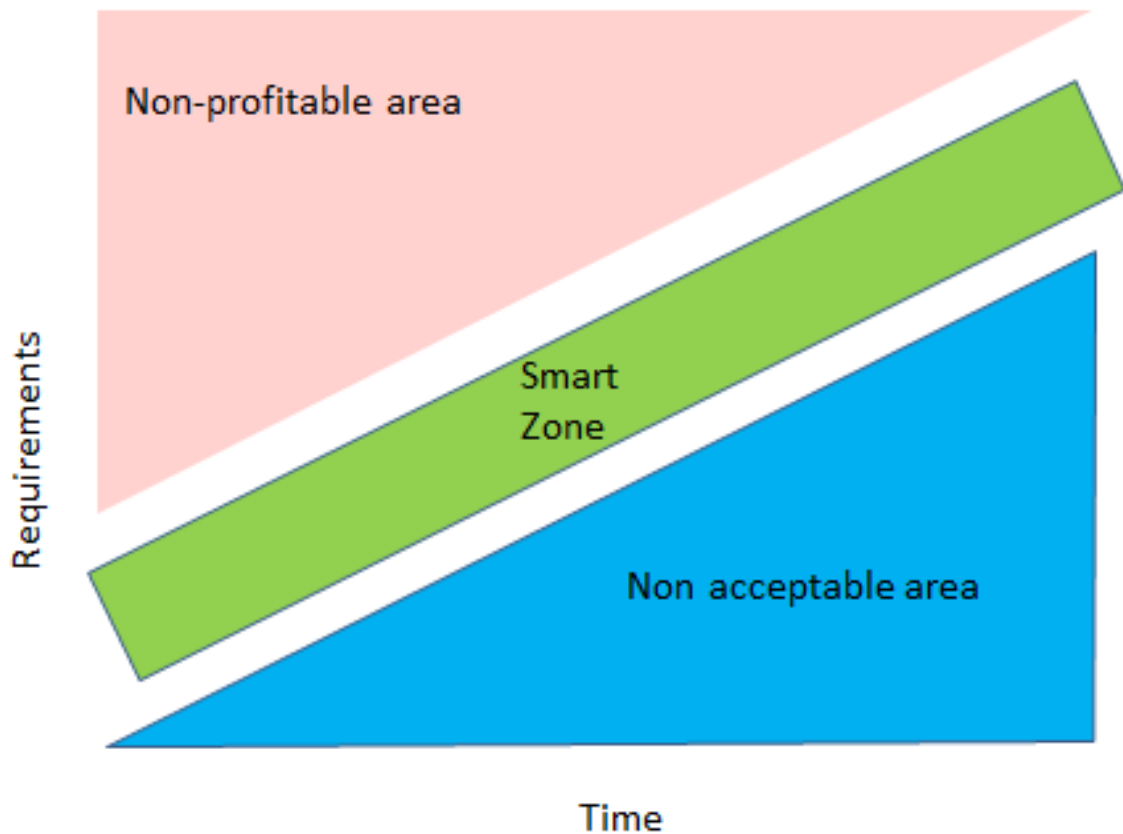
The dynamics within a marketing group are very interesting in terms of maintaining quality and delivering on certain assurances. I came across a lamb group recently



that had secured a dedicated supply contract with a major retailer. Within the attractive package offered by the farmer group to the retailer, lamb produced to a high welfare standard was a component. I asked the farmers what they meant by high welfare? The answer was that they would go beyond what was required to pass the annual farm assurance visit and they would deal with a sense of immediacy with any welfare challenges facing their ewe flock. In other words, each day would be dealt with as a possible inspection day. To ensure the standards of the group the farmers inspected each others' farms. The result was that they asked one farmer who did not meet their standards to leave the group. Incredibly this farmer already held a farm assurance certificate from the retailer in question.

The drawback of existing farm assurance schemes is that they are based on minimum standards, visits are far apart, and new methods of measuring welfare are not forthcoming. However stockmen who intrinsically understand animals, who are involved in a group situation producing a premium product for a premium price, have a vested interest in ensuring that group standards are kept true. Peer pressure is a highly effective accreditation tool.

## 11. What drives sustainable welfare improvements?



### **"Smart zone" for premium products aspiring to higher welfare**

There are many drivers to welfare, including greater understanding through science and changing moral attitudes. It is important that welfare demands are backed by science and not seen as a marketing edge for private assurance schemes. Welfare standards above the legal minimum can potentially raise production costs. Unless consumers pay a higher price for these products, the business model becomes unsustainable.

The above graph shows the 'smart zone' for premium products that aspire to higher welfare. This theory was put over to me very strongly in New Zealand and Australia where the market is the sheep farmer's only source of income. Sheep farmers in both countries work very hard *on* their business in addition to *in* their business to stay in the smart zone, and judge and react to market demands, tempered by their financial return.

## 12. Welfare Compliance

A breakfast meeting with Hilton Collier, Agricultural consultant and a member of NAWAC (FAWC's equivalent in New Zealand) gave me an insight into New Zealand dairying. Hilton works very closely with a number of dairy clients, and was able to give us a very clear picture of how the volatility in the global prices of milk products is affecting farm incomes, farm planning, and consequently in some cases cow welfare.

The sequence has been:

*Stable milk pricing – low cost and balanced pastoral and climate based system – significant milk price increases – farmer reacts to the market and increases herd size, establishes dairy farms on marginal land, moves into higher input systems to achieve higher yields –*

*what goes up usually in my experience comes down – lower milk prices - economic pressure on farming systems leading to cut in inputs, and an effort to return to the low cost and balanced pastoral and climate based system.*

*Result; low farmer morale, surplus dairy cows on the market, dairy cow welfare compromised.*

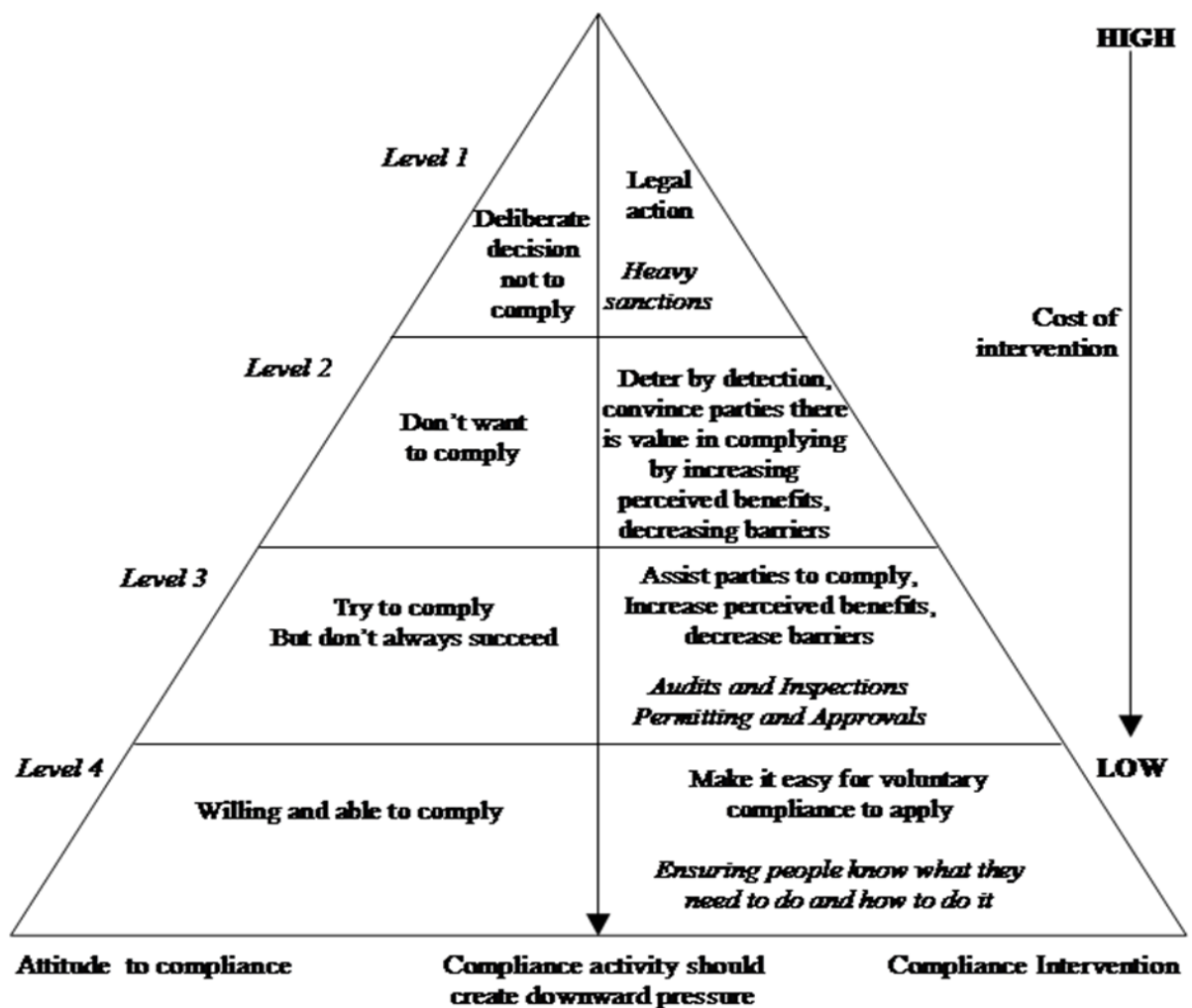
The remoteness and the lack of subsidies mean much less bureaucracy and on-farm surveillance within the farming industries of New Zealand potentially leading to the later identification of serious on-farm welfare incidents. The New Zealand Government in conjunction with industry has, however, identified the need to improve the welfare compliance on their farms and the New Zealand MAF Animal Welfare Team has responded by bringing out a draft document called Safeguarding our Animals; Safeguarding our Reputation - Improving Animal Welfare Compliance in New Zealand.

This 'compliance triangle' concept (see diagram on next page) is the basis of a strategic approach to animal welfare Compliance and Enforcement designed to encourage voluntary compliance with legislation and supporting codes of welfare. This involves increasing the emphasis on education and industry involvement, *versus* a purely prosecution-based approach.

The plan has now been approved by the Minister of Agriculture and received the necessary budget funding. It will be progressively implemented over the next 4 years, after which a formal review of impact and progress will take place. Considerable interest has been shown in this strategic approach, from other jurisdictions, including the EU.



Dr. Virginia Williams and the Hon David Carter, New Zealand Minister for Agriculture, Biosecurity and Forestry, meeting me and Sheila in Wellington, New Zealand.



### 13. Lamb production costs

#### Sheep production costs (£/ewe) converted to a standardised basis

	Australia	UK	New Zealand
Variable Costs			
Feed and Forage	7.39	13.25	1.48
Other	8.41	9.25	4.72
Total	15.78	22.50	6.20
Fixed Costs	17.17	41.70	20.53
Total Costs	32.95	64.20	26.73

*Source: Red Meat Industry Forum 2007*

#### Lamb Production Costs (Wales)

Pence/KG liveweight	All Farms	Top third	Bottom third
Total Costs	151.68	125.39	181.39
Net Margin	-16.24	22.57	-55.31
Av lamb liveweight KG	38.3	40.5	36.49

*Source: Wales Farm Income Booklet 2008/09 Results*

The average farmer in Wales would have made a net loss of £6.21/lamb according to the above table (2008 lamb crop) compiled by the Farm Business Survey team at Aberystwyth University. According to the same research, Welsh Upland Beef and Sheep farms would have received £34,730.00 in support payments.

Mr Don Nicholson, Chairman New Zealand Federated Farmers informed me in June 2010 that during last season an average lamb realised \$74 resulting in a net profit before tax of \$9. New Zealand is about to embark on an emission trading scheme and he calculated that it will take over 12% of the lamb net profit before tax to pay for it.

New Zealand relies totally on the price realised in the market place. Don would have made a net profit of £4.20/lamb in 2010. I believe that he has decided to switch from lamb production to dairy production for obvious reasons.

Lamb production in an unsubsidised environment can hardly be considered profitable globally and can lead to negative welfare implications. Financial necessity can result in stockmen seeking work off farm which leads to less scrutiny of stock, and poor reinvestment in farm infrastructure such as handling facilities.

New Zealand export 90 % of their pastoral product but often the price they realise for their product is disappointing which can result in the lowering of the UK price of lamb.

## 14. Conclusions

- Stockmanship is the key to good animal welfare, and should underpin all animal production systems irrespective of locally acceptable management practices.
- The majority of stockmen know if their animals have a life worth living and do something about it if they don't.
- Animal welfare is abstract and difficult to quantify.
- Peer pressure within marketing groups (national or local) results in improved welfare due to the need to protect brand integrity, maximise market value and the greater degree of scrutiny.
- The New Zealand ewe flock as a whole has a life worth living but certain individual ewes do not.
- New Zealand and Australia are leading the way in using scientific genetic improvement to improve their flocks.
- New Zealand and Australian lamb imports are necessary to maintain continuity of supply on UK retailers' shelves.
- Welfare surveillance in New Zealand is under-resourced and inadequate on farms. This is being addressed by a Government-led initiative.
- UK retailers have a positive effect on animal welfare in exporting countries.
- Lamb is expensive for the consumer but the return to the farmer does not often cover the cost of production.
- Welsh sheep farming would not be viable without support payments.

## 15. Recommendations

- Strong relations should be established between the lamb producers in Australasia and the UK, leading to an exchange of best practice ideas that rise above the inevitable commercial competition.
- The Welfare Quality© project should be challenged to deliver a practical 'on-farm' assurance scheme, which justifies the expense of the project to date.
- Labelling and food provenance in the UK catering sector must become more transparent, allowing customers to choose if they want to eat lamb from a country where certain husbandry practices such as museling are used.
- The WTO and OIE should give a higher priority to farm animal welfare and whilst, encouraging incremental improvements in animal welfare, should set a benchmark of acceptable welfare and rank production systems within countries accordingly.
- Dialogue and partnerships within the food chain should be facilitated within the food chain (primary producer, processor and retailer) with the pragmatic understanding of market forces.
- Animal welfare research should be funded to ensure a greater understanding of the needs and wants of farm animals.
- Guardianship - a decision should be made as to the role of Government in guarding the welfare of farm animals, i.e. protecting them from the vast economic forces and vested interests that affect their standards of welfare.
- Breeding practices within the UK beef and sheep sectors should be assessed, e.g. the role of vets in practices such as repeated caesareans in individual animals.
- Farm assurance schemes should base their requirements on sound animal based science.



## 16. Postscript

The last 18 months have been a voyage of discovery with the inevitable highs of travelling to new places, meeting new people and enjoying the company of a whole new bunch of friends – my fellow Nuffield Scholars.

One of the key developments that have arisen from my travels is that there are three new rams at Llandre this year: three Highlanders which are a composite breed developed using the New Zealand philosophy of genetics in addition to cosmetics. On a national level I will continue to strive for a pragmatic approach to improving animal welfare on our farms.



**Highlander Rams on Llandre and ready to work.**

**Huw Davies NSch. F.R.Ag.S**

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I am extremely grateful to my main sponsors, the Royal Welsh Agricultural Society, and the additional financial assistance given by Riverlea Tractors.

My travels would not have been possible without the support of my family, and Mr Irwel Jones who took charge of the farm in partnership with my father during my eight weeks absence.

Numerous individuals and organisations, at home and abroad, have provided valuable assistance during the period of my study and I sincerely thank them all, but special mention needs to be made of the extraordinary assistance provided by:

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- Mr Terry Johnson, a man with a vision, and the capacity to deliver on expectation. A perfect host.
- Sir David Lewis, Cwrt-y-Cadno, whose influence has enabled me to focus on my potential, rather than my limitations.

## 18. Global assistance and contacts

### United Kingdom

Minister Elin Jones, Welsh Assembly Government  
Mr Doug Brydges, International Meat Trade Association  
Miss Annie Graham, J Sainsburys  
Miss Alice Swift, J Sainsburys  
Miss Margaret Griffiths, Welsh Assembly Government  
Mr John Mercer, National Farmers Union  
Miss Michelle Waterman  
Mrs Eirwen Williams, Menter a Busnes  
Freedom Food  
Dr. Emma Roe. University of Southampton  
Mr Bill Joyce, Hybu Cig Cymru  
Telesgop

Mr Paul Edwards, Dunbia  
Mr Gwyn Howells, Hybu Cig Cymru  
Mr Moss Jones, Welsh Lamb and Beef Promotions  
Mr John Yeomans. NSch  
Dr. Christianne Glossop, CVO, Welsh Assembly Gov't  
Mr Gwyn Jones. NSch  
Miss Ruth Layton, FAI Oxford  
Mr Siôn Ifans, Menter a Busnes  
W.D. Lewis & Son  
Mr David Prichard, DEFRA  
Mr William Haire. NSch  
Dr. Sophia Hepple, DEFRA

### New Zealand

Silver Fern Farms  
Dr. Jim Webster, AgResearch  
Dr. Lindsay Mathews, AgResearch  
Mrs Julie Hood, New Zealand Veterinary Association  
Mr Jockey Jensen, MAF New Zealand  
Associate Professor Craig Johnson, Massey University  
Mr Kevin Cresswell, New Zealand Meat Industry Assoc  
  
Miss Jacinta Gould, New Zealand Government Foreign  
Affairs and Trade  
Mr Don Nicolson, Federated Farmers of New Zealand  
Mr Barry O'Neil, Biosecurity New Zealand  
Gallagher New Zealand  
Mr Ceri Lewis, Mt Linton Station (and colleagues)  
Professor Dave West, Massey University  
Mr Tony Friedlander, New Zealand Road Transport  
Mr John Harrington, Te Mania Angus Stud  
Mike and Jan Studholme, Waimate  
David and Janet Morgan, Pleasant Point

Alliance Group Limited  
Dr. Greg Lambert, Ag Research  
Mr Hilton Collier, NAWAC  
Mr Richard Wild, New Zealand Food Safety Authority  
Mr Ben O'Brien, Meat & Wool New Zealand  
Professor Stephen Morris, Massey University  
Mr Richard Ivess, New Zealand Government Foreign  
Affairs and Trade  
Hon. David Carter, New Zealand Minister for  
Agriculture, Biosecurity and Forestry  
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Rae and Roslyn Mitchell, Wairuna

### Australia

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Dr. Keith Walker, Animal Health and Welfare  
Dr. Sandra Welshman, Frontiers Insight  
Mr Rodney Watt, Sheep Council for Australia  
Mr Jim Paradise, International and Live Exports  
Dr. Kevin Doyle, Australian Veterinary Association  
Mr Greg Weller, Wool Producers Australia  
Mr Jim Geltch NSch. Nuffield Australia

Fletcher International Exports  
Mr Cameron Hall, LiveCorp  
John and Lyn Sykes, Dubbo  
Mr Ian McColl, Sheep Council for Australia  
Mr Tim Lester, Animal Health and Welfare  
Mr Ron Cullen, Sheep Meat Council  
Mr Ben Fargher, National Farmers' Association

### Brazil and Uruguay

INAC Uruguay (The National Meat Institute)  
Bertin Foods  
Mafrig Group  
Breeders and Packers, Uruguay

Solis Meat  
Dr. Alvaro Nunez, MGAP  
Damha Pecuaria  
Miss Sarah Morrison BPU