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The NZ Meat Industry to 2025

The New Zealand Meat Industry to 2025. Threats, Opportunities, and a Way Forward

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Executive Summary:

This report aims to assess the future of the New Zealand sheep and beef sector through to 2025. The assessment is based on an examination of the internal and external constraints that will influence meat production and their potential effects. It then suggests a vision for the industry, and the types of strategies needed to turn threats into opportunities and secure the long-term viability of the industry.

1. Constraints:

Land use change from sheep and beef into other land usages is set to follow a path similar to the last 20 years, with around 1% of total sheep and beef farmland lost to other uses every year. This will be driven by better economic land usages, or increasingly by local government regulation aimed at the retirement of erosion-prone hill country. At the same time, increases in per hectare productivity will become more difficult as regulators put in place rules designed to prevent the intensification of farmland. The net impact will be declining total production levels from the sheep and beef sector, and potential declines in land values, particularly in steeper hill country.

The government's Emissions Trading Scheme, starting in agriculture in 2013, will potentially devastate the industry by introducing costs that they have no way either of passing on to consumers, or of mitigating without removing significant land area from farming activities. Net impact is likely to see both further declines in total sheep and beef farm area and production, and increases in on-farm sunk costs. The scheme goes far beyond Kyoto Protocol commitments and, unless other countries follow suit with similar emissions regulations, will in all likelihood end up actually increasing global emissions from agriculture.[1]

2. Global Marketing Trends:

Demand for red meat proteins from developing countries will rise quickly over the next decade. While some of this demand will be met by increased supply, rises in feed grain prices will see real prices for red meat products increase substantially, leaving grass-fed meat producers relatively better off.

[1] See Appendix I.

Increased demand for meat proteins will largely be driven by increasing per capita incomes and other demographic trends. At the top end of the market, total demand for meat proteins will only increase slowly, but the attributes demanded by such consumers will change dramatically. Affluent consumers increasingly demand systems and processes in production that have beneficial impacts on the environment, and the tidal wave of 'green consumerism' will only gain momentum in the years to 2025.

Over time the retail sector will become ever more dominated by large supermarket chains. This will further cement their abilities to dictate price to those suppliers whose products are similar to one another, and who are many in number - the basic structure of the current sheep and beef exporting sector.

3. Processor-Producer Relationships:

Largely due to overcapacity problems in processing, the sheep and beef sector has an inward-looking focus, exacerbated by declining numbers of stock available. The industry is also characterised by low profitability at both farmer and processor level. This denies the industry the ability to take a longer-term view, impacts on R&D spends, and hence industry viability moving forward.

Excess competition for stock at the farm gate due to a processor focus on maintaining plant throughput have denied farmers the incentives to sign long-term supply contracts with processors. The relationship between farmers and processors is dysfunctional in that the two groups see each other as combatants, not partners, even though the vast majority of the processing sector is owned by them.

This relationship has a major impact on marketing. An inability to guarantee a reliable supply of livestock constrains the abilities of exporting companies to enter long term supply contracts with retailers, prevents long-term strategic decision-making, and increases processing costs.

The short-term, inward focus of the industry and the excess competition for stock also ensures that producers are not given the right pricing signals that provide the incentive to change. Producers are not necessarily rewarded for producing quality products as prices received are reflective not just of market requirements

but a range of other variables. The averaging system currently used in grading stock actually works as a dis-incentive to improve farm management systems.

4. A Vision of 2025

The sheep and beef sector currently lacks any industry vision of where it would like to be at a given point in the future, and so strategic planning tends to be sporadic at best, and piecemeal in its approach. Therefore this paper proposes the following:

Vision – By 2025:

For the New Zealand sheep and beef sector to be the preferred supplier of red meat products to the world's most discerning customers.

The industry needs to overcome some major threats if they are to achieve this vision. The key threats in New Zealand are the impacts on the industry of national and regional government regulation, and the inter-related problem of declining land available for production. On the one hand this will mean increasing costs of production for individual farmers, while at the same time declining production on individual farms and thus loss of income.

Declining total production will obviously increase overcapacity problems in the processing industry, and further exacerbate tensions between them and farmers. Lack of loyalty to a single processor, and an unwillingness to invest in the industry outside the farm gate will not be helped by low on-farm profitability.

Externally, the industry must find a way to combat the buying power of retail supermarket chains. As regards consumers, the main threat to the industry is ignoring 'green consumerism' in foods – the trend of affluent consumers demanding not just a superb eating experience, but also that the products are produced in such a way as to make the planet better off.

To become the preferred supplier of red meat to the world's affluent consumers means that the industry needs to convince these consumers that they are the world's best, not just in terms of eating quality but in the systems and processes the industry has in place to ensure both product safety and sustainability of our management systems. The industry needs to leverage off the '100% Pure'

campaign that is how this country is marketed to the world, and promote a 'New Zealand Pure' product. One brand implies a co-ordinated approach to marketing. Ideally, this would be one company to avoid the problems of free riders, capture the maximum benefit for the industry, and enable scarce resources to be used to maximum effect.

The sheep and beef industry needs to set clear targets, and timeframes to achieve these targets, in regards to sustainable land management. A plan must be developed that allows the industry to position itself as demonstrably the best land stewards in the world – including random auditing of on-farm performance. Being the world leader in 'green' production systems gives the industry the chance to truly differentiate our products from all global competitors. To provide farmers with the incentive to change their management systems, the grading system needs to be changed to reflect not just the quality of the product, but also to reward individual farms that apply world's best processes.

Acceptance and recognition by farmers that they are largely the cause of, and the solution to, the industry's problems is critical. The key requirement in achieving the vision is a far closer relationship between farmer and farmer-owned co-operatives. Without this, nothing else is possible.

Foreword:

The sheep and beef sector in New Zealand has been through many upheavals since the export meat trade began with the journey of the *SS Dunedin* to London in 1883 – upheavals that have wrought structural change in the industry. The current meat industry is itself a reflection of the removal of subsidies for sheepmeat production in the mid-1980s, and the subsequent changes this forced. The one constant through all this has been the industry's ability to innovate and keep pace with change and, most importantly, the wider markets they serve.

However, the intent of this paper is not to look backwards at history, but rather forwards towards the year 2020. The industry has entered a period of change, driven by both internal and external factors, that require a fundamental re-think of the way it conducts itself. Furthermore, a failure by the industry to be proactive in responding to these factors could well see a long-term decline in its viability, from which it would find difficult and costly to recover.

Responding to and deriving advantage from these factors requires firstly an understanding of how these factors influence the industry, and then how to work with these influences to derive the best possible future position for the sheep and beef sector. A clear vision is required, a vision sadly lacking in the industry at present, together with a clearly defined strategy to achieve this. For the simple fact is that if we as an industry do not manage this process of change, the process will end up managing us.

Introduction:

More than 100 years ago, the steamship SS Dunedin left Port Chalmers bound for England, marking one of the key events of New Zealand's history. Inside its newly refrigerated hold lay hundreds of frozen sheep carcasses, destined for London's Smithfield markets and ultimately dining tables throughout the United Kingdom. With this one successful voyage, the future economic prosperity of this country was forged. No longer did we have to rely on finite mineral resources for economic expansion, rather we could concentrate on the production of goods that New Zealand's climate and topography proved eminently suitable for, and that had a market prepared and willing to take all our surplus production.

It was the dawn of a new age, yet as the New Zealand meat industry moves into its second century, changes occurring both from within this country and from markets overseas threaten to marginalise this previously dominant industry. The New Zealand meat industry has always had a narrow inward-looking production focus, a focus forced on it by the relationship between producers and processors, successive government policies, and none-to-demanding markets. The industry has a history of being reactive to external forces, rather than proactive – quick to change when it needs to, but rather slow to see these changes coming, or the effects they will have. Short-term thinking dominates the industry.

However, vision and leadership are required if the industry is to capture and maintain the top end of red meat protein markets around the world in the future, yet these qualities appears to be sadly lacking in the meat industry at present. Indeed, there is currently no recognised industry-wide vision or strategy as this paper is being written, a staggering oversight for a $5 billion export industry. Anticipation of coming trends and patterns and effective strategies to take best advantage are the *sine qua non* of effective organisations and industries. However at the present point in time, the industry has no clearly articulated vision of where it would like to be in the future, leaving producers – who own

much of the industry's processing and exporting capacity, and whom are the base from which the success of the industry springs – with no clear idea of how they need to position themselves for best results into the future.

The industry requires far greater levels of co-operation in what is clearly a highly interdependent structure already. Internal production and regulatory constraints, and external market demands affect everyone in the industry, and will require co-operative efforts to overcome for best result. "Let us all hang together, lest we all hang separately", in the words of Benjamin Franklin. This requires changing industry culture to one of true partnership between producers and processors. Farmers, as owners of much of the industry (including industry-good body Meat & Wool New Zealand), could easily overcome these issues, especially given that they co-operate incredibly well together inside the farm gate, as the huge productivity increases on-farm over the past two decades demonstrates. Yet currently they don't show this same degree of co-operation once their product leaves their farm – although this is perhaps understandable given the lack of clear direction as to where they are all headed.

Thus the intent of this paper is to examine the constraints facing the production side of the industry over the next two decades, and then to look offshore at key market trends and conditions. These opportunities and threats will be analysed, before arriving at a vision of where the New Zealand meat industry should be aiming at by 2025, along with strategies and requirements necessary to achieve this vision.

1. Internal Constraints

The production side of the New Zealand meat industry operates within constraints placed upon it by internal and external forces. For many decades from the advent of export meat shipping, these constraints were largely of its own making, relating to the amount of land being used for sheep and beef production, and the productivity derived from that land. The economic wealth of New Zealand was built on the sheep's back, with a result that the regulatory and social environment surrounding the industry was benign, with government generally being content to try and provide a supportive environment in which the industry could grow.

On the immediate horizon, however, lie constraints that will mean the industry, at best, will only be able to maintain current levels of production. The first constraint revolves around land use change, and in large part is the responsibility of individual farmer decision-making, although the cumulative effects must be taken into consideration by the industry as a whole. The other two major constraints revolve around the potential impact of the changing regulatory environment in which the sheep and beef sector finds itself, and can be loosely titled sustainability and climate change constraints.

1.1. Land Use Change

The advent of refrigerated meat shipping from New Zealand in 1883 heralded a boom in the agriculture sector. Till then, the only agricultural export of note from this country was wool. Once refrigeration technology hit these shores however, the primary sector was changed forever. Suddenly farmers could choose which type of animal best suited their climate and topography knowing that wool type had become relatively less important. Sheep numbers in particular boomed, and land development intensified as breeds like the Romney Marsh and the Southdown proliferated, they being far more suitable both for lowland farms and for meat production, while the dairy industry, just as heavily

dependent on refrigeration technology and requiring fertile lowlands for best milk production, also began to prosper.

From the beginning of the meat export trade stock numbers rose slowly as both more land was brought into pastoral production, and through improved farm management practices. By 1900 sheep numbers had hit 13 million, with these doubling to 26 million in the space of a decade. By the early 1960s sheep numbers had increased to about 50 million; by the mid-1970s around 57 million, coupled with around 4 million beef cattle. However, the next decade saw sheep numbers explode to more than 70 million while beef numbers dropped nearly 19%. The sole reason for this occurrence was subsidisation of the sheepmeat industry, which began in 1978 and was stopped by the incoming 1984 Labour government, although subsidy payments didn't finish altogether until 1986.

The removal of the subsidy schemes were catastrophic for farm-gate prices. In the space of a year, lamb prices plummeted to less than half of what they had been. Farmers responded quickly to this by quickly dropping the numbers of sheep they carried on their farms. In the five years from their 1984-85 peak to 1989-90, total sheep numbers carried on New Zealand farms dropped by more than 13%, with largest declines seen in ewe breeding flocks.

The continuing liquidation of the ewe flock indicated that larger decreases in the size of the national flock were inevitable - fewer ewes meant fewer lambs. This decline continued, to the point where in 2006, total sheep numbers had fallen to around 40 million, down from 70 million at their 1984-85 peak. The sheep flock in New Zealand is currently at its lowest level for nearly 40 years.[2]

The decline in sheep numbers (beef cattle numbers have remained reasonably stable from the late 1980s on, at round 4.5 million in total) cannot be laid solely at the door of production subsidy removal however. In many cases the increase in sheep numbers on farms had come about due to farmers utilising marginal land for their production. Farmers became eligible for low or no interest loans when

[2] Meat & Wool New Zealand Economic Service

breaking in new land during the 1970s, and so farmers began developing land for sheep production that had previously been thought unsuitable for such a purpose – largely because it was a much poorer class of country. Once subsidies were removed, much of this sort of country became financially unsustainable for farmers, with returns from sheep production unable to match that of other land uses for this land class, such as agroforestry.

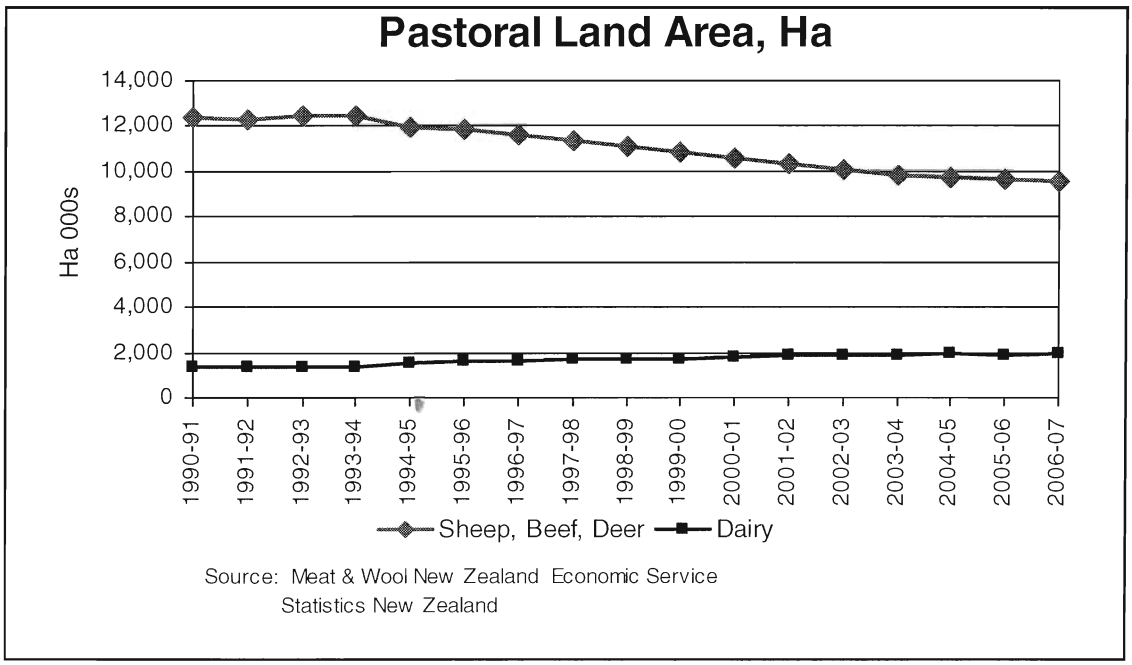
Subsidies encouraged negative environmental impacts through the development of marginal pastoral land, which could be seen in the increased levels of erosion as more and more land was brought under the pastoral umbrella, and the land itself was farmed more intensively – more than the land could sustain in many cases. However once sheep prices nose-dived, much of New Zealand's countryside that once supported these sheep, particularly the steeper and more erosion-prone land, was planted in a blanket of radiata pine and other tree species, or retired to allow native vegetation to regenerate.

Reductions in the national flock also resulted from other differing land uses, a process that continues to this day. At the same time that sheep farmer incomes were decreasing, those in the dairy industry were, in the main, rising. Consequently, some farmers whose land was good enough to sustain a dairy herd converted to this form of pastoral production, while others sold part of or all of their properties so that they could then be converted. The upshot of increased numbers of dairy cattle also meant increasing demand for dairy grazing off farm, an opportunity many drystock farmers began to take up, especially as this form of farming is not subject to weekly changes in product prices, but instead offers a known, stable cashflow.

Other sectors, notably the viticulture and horticulture sectors, have also made large inroads into what was traditionally sheep and beef country. The massive expansion of grape-growing in the Marlborough, Hawkes Bay, and Central Otago regions, as the prime examples, simply reflected a more economic use for the land.

The upsurge in demand for 'lifestyle' blocks in the country by previously urban dwellers has also had an impact. It is an unfortunate fact that much of the most fertile land in New Zealand is within very easy commuting distance from major cities, and is the very land being slowly parcelled up into 5 or 10 hectare sections for lifestyle blocks. While this land tends to be dominated by dairy or intensive bull beef farms, this has the effect of pushing these farms further out onto country that has traditionally been used by more extensive sheep and beef farms.

Figure 1:



As Figure 1 above demonstrates, the period from 1990 through to 2006 saw a massive decrease in the amount of land used for sheep and beef farming. More than 287000 hectares of land was retired from sheep and beef production and planted in plantation forestry, with thousands of hectares more, generally in very small blocks (less than 10 hectares), planted in native species or allowed to regenerate on-farm. Meanwhile, in the past 13 years nearly two thousand new dairy farms have taken the place of sheep and beef farms around the country, while whole districts have changed land use from pastoral farming to viticulture

or horticulture. Urban sprawl and the increase in lifestyle blocks around the country have also played a major role in the reduction of land area used for sheep and beef farming.[3]

All told, the total effective area used for sheep and beef production in New Zealand has dropped from 12.4 million hectares in 1990, to 9.6 million hectares today[4], a drop of some 23%. As a consequence, and over the same period, sheep numbers dropped by 32% and beef numbers by 4%.[5] To put it another way, every year over the last 17, the meat industry has lost 1.6% of its most important physical resource – land.

And there is nothing to suggest that this will change in the period to 2020. Land tends to end up being used for its best economic purpose – hence the very worst land being planted in trees, while the best sheep and beef country (particularly as regards contour) changing land use to dairying, viticulture, or urban sprawl. The relatively low profitability of farms in the sheep and beef sector, and the comparatively high profits to be made from these other land usages, have seen a rush out of sheep and beef farming in recent years. This shows no sign of abating in the short term.

As a consequence, the industry should expect further declines in total numbers of sheep and beef cattle employed on farms - at current rates a decline of around 1% per year. However, there is the possibility that this decline will be hastened by factors over which the industry has very little control – the regulatory environment surrounding the industry.

1.2. Environmental Regulatory Constraints

Despite the large drop-off in total sheep and beef numbers, to a large extent this decline has been made up for in on-farm productivity increases. In the fifteen

[3] Ibid.
[4] Statistics New Zealand.
[5] Meat & Wool New Zealand Economic Service

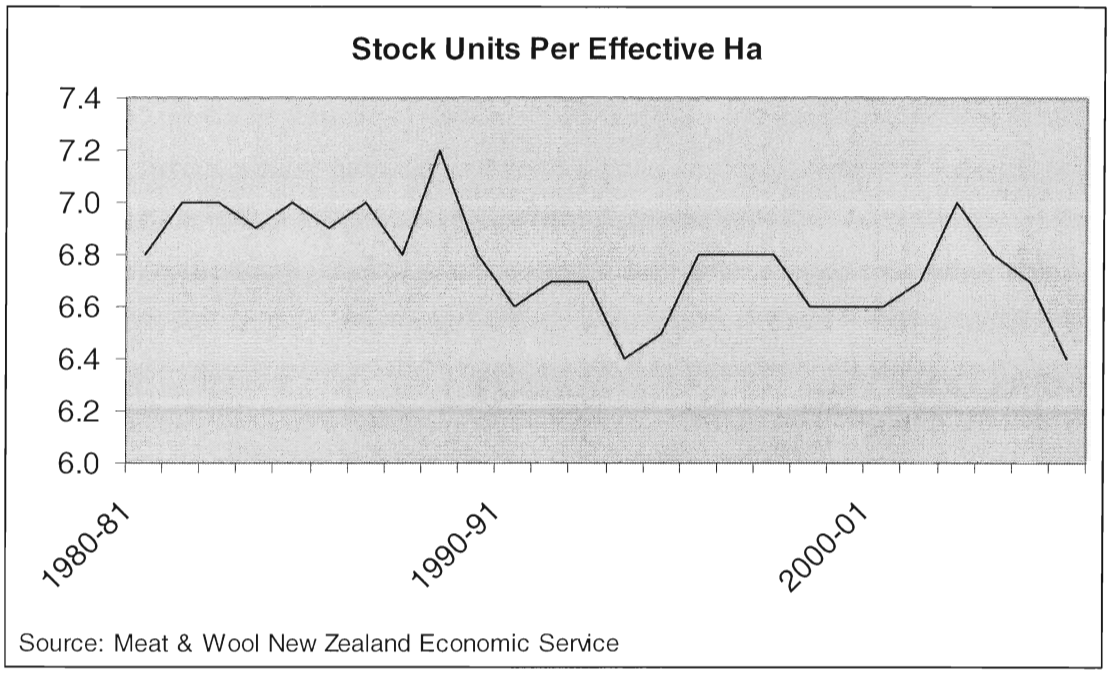
years to the end of the 2005-06 season, and despite a small percentage decrease in beef cattle numbers and a 32% decline in sheep numbers, total production from New Zealand sheep and beef farms increased by 19% in the beef and veal sector, and 12% in the lamb sector.[6]

In essence the industry was able to do two things; to increase the per head performance of its breeding flock, and lift lamb and beef slaughter weights. Lambing percentages in New Zealand's ewe flock lifted more than 20%, while farmers also began lambing hoggets. At the same time, average slaughter weights for lamb increased by 20%, and for beef cattle by 6% over the same time-frame.[7] In the main, these productivity increases can be explained through the use of better animal genetics, better grazing systems, higher performing forage crops, and improved farm management systems.

It is important to note here that these increases have come about due to vastly improved *per head* animal performance. As figure 2 below demonstrates, the amount of stock units per effective farm hectare, averaged across all New Zealand sheep and beef farms, has been showing a slowly declining trend over time (variations since 1990 can largely be explained by relative farm profitability levels). Thus the common perception that productivity increases on sheep and beef farms are due to the intensification of these farms – assuming that intensification is defined as more animals being run on the same amount of farm area – is incorrect.

[6] Ibid.
[7] Ibid.

Figure 2:



Rather, New Zealand's sheep and beef farms are being run at similar stocking rates to 1990 figures, but farmers have been able to vastly improve the efficiency with which they farm. This suggests that feed conversion rates have improved – in essence animals are eating less feed to produce more product. This point is made not to suggest that sheep and beef farming has no negative impacts on the environment, but instead to highlight some of the problems, issues and mis-conceptions that surround the next key constraint facing the sheep and beef sector - the internal regulatory environment that surrounds the industry.

1.2.1. Problems and Issues

Until subsidies were removed in the mid-1980s, national and regional government had done their best to design policies to ensure growth in the industry. However, and particularly in more recent years, the impact that the

industry has on the natural environment – the negative externalities associated with the production of sheep and beef - has been called into question.[8]

Over the past decade, the issue of environmental sustainability on farms has come to prominence in the wider sheep and beef industry. This rise to prominence has been driven, in large part, by Regional Councils, who in turn have a duty to reflect the perceptions and concerns of the general public as a whole regarding New Zealand's environment. Regional Councils (RCs), operating under the Resource Management Act, have a duty to their stakeholders to ensure that activities undertaken by entities within their jurisdiction do not have a negative impact on the wider environment. These impacts come in a wide variety of guises – including any inputs used in, or outputs from, sheep and beef farms, that are seen as having a negative effect.

In essence, the main environmental issues in New Zealand over the past decade can be boiled down to the following key areas of focus:

1) soil conservation and degradation
2) water quality and water allocations
3) global warming and climate change

Biodiversity

While this paper will go on and discuss global warming and climate change, regional councils concentrate on the first two areas in their relationship with the sheep and beef sector.

At the heart of the environmental sustainability debate, and of key concern to regional councils, is the issue of appropriate land use. Moves towards a more regulatory environment for sheep and beef farmers have been driven by the perceived impacts that intensification of their activities has caused. While these impacts differ from region to region – water allocation issues in Environment

[8] This document has been aimed at a farmer audience, and thus the intent is not to delve too deeply into economic jargon. However, policymakers in New Zealand at both a national and regional level are beginning to focus on negative externalities created by the sheep and beef sector, and are trying to find ways to price these externalities. They appear to make the implicit assumption (given no policy to the contrary), that the sector does not create also beneficial externalities. Even when looking only at negative externalities, the New Zealand sheep and beef sector creates far less negative externalities than those of our major trading partners. For a far more detailed discussion of externalities and national and local policy-making, and the potential impact, please see Appendix I.

Canterbury's region or soil erosion in the Horizons Regional Council region for example – mitigating these impacts has become a key policy of councils throughout New Zealand.

Studies throughout the country point to serious concerns about New Zealand's environment. In Canterbury, the number of lowland streams graded as poor or very poor by Environment Canterbury increased from around 50% in 1999 to 80% in 2005, while NIWA studies indicate similar increases throughout the country.[9] Similarly, declining water quality in iconic water bodies such as Lake Taupo and the Waikato River, and the Rotorua Lakes is a major concern to Environment Waikato and Environment Bay of Plenty, respectively. Soil erosion, particularly on steep Class 6 and 7 land (which if it is not covered in trees, is generally dotted with sheep) can be a problem throughout the country, particular as a result of extreme weather events.

1.2.2. Regulatory response

As a result, RCs began designing and implementing policies designed to address some of these issues. They initially concentrated their efforts on the impact of 'point source' outputs. Point sources are discrete points, such as dairy farm effluent systems or sewerage treatment plants, where:

a) any outputs come from a clearly defined source
b) this source can be relatively easily monitored

After bringing these sources under control, in the late 1990s and into the new century their focus began to move to non-point source discharges where outputs, although potentially just as damaging to the environment as any other, are far harder to both measure and monitor (especially given that problems associated with normal farming practice had only emerged, with sufficient scientific evidence to back this up, in recent years).[10]

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[9] Greg Meylan, "*And not a drop to drink*", Sunday Star-Times, 3/6/2007
[10] James Reeves, Environmental Sustainability – A Strategy for Meat & Wool New Zealand, Unpublished paper, 2006

Up until the end of the 20th century, the regional regulatory framework surrounding the pastoral sector was fairly permissive – and to varying degrees around the country still is. Although most councils had guidelines in place in their regional plans devoted to pastoral farming, adherence to these was voluntary. However this has begun to change, catchment by catchment and region by region, in response to identified environmental issues and as councils devote more resources to the issue.

To date, Environment Waikato and Environment Bay of Plenty are the two RCs that have enacted major policies that directly affect sheep and beef farmers in the catchments surrounding Lake Taupo and the Rotorua Lakes. Both councils have identified increased fertiliser use, and the intensification of farming this allows, as one of the factors contributing to declining water quality in these lakes. In response, both councils now require farmers in these catchments to adhere to a variety of different rules designed to ensure that nutrients leaching from individual properties do not increase, and over the long term decrease.

EW initiated a change to their Regional Plan called "*Proposed Variation 5 to the Waikato Regional Plan: Lake Taupo Catchment*". In it they have laid out the new regulations that will apply to farms within this catchment. The main focus of this plan is to reduce nitrogen leaching into the catchment by at least 20% by the year 2020. As regards sheep and beef farms, the major regulation changes will be:

- to make farming in the Taupo catchment a controlled activity, in other words requiring farmers to obtain a resource consent to farm
- to cap nitrogen use on these farms based on past history of use ("grandparenting")
- these farms will need a Nutrient Management Plan (NMP) in place that demonstrates how nitrogen outputs on each property will be managed and, over time, reduced

Similar sorts of policies are intended around the Rotorua Lakes catchment. Again, nutrient benchmarks will be put in place, with existing nitrogen and

phosphorus loss from properties capped, although at the time of writing, no rules had been put in place in terms of farmers having to reduce their nutrient loss.

Meanwhile other councils around the country are in the process of trying to develop Community Plans that address issues in their regions. Horizon's proposed One Plan, for example, aims to remove sheep and beef from grazing much of the steepest land, with incentives available to farmers ranging from free Land and Environment Plans (LEPs) to being able to trade the carbon credits on land they do retire. Regional councils in both Waikato and Canterbury are currently grappling with issues pertaining to the over-allocation of water, with the likelihood that regulation to control water use will occur.

In the medium term (to 2025), the sheep and beef sector can only expect the outside scrutiny of their farm management practices to intensify, largely driven by the wider public's desire to know exactly what farmers do with their land, and what effect individual farms have on the wider environment. This will be exacerbated by the growing urban-rural divide. New Zealand is currently raising a generation of people with virtually no idea of what does actually happen on a farm, and therefore only learn about it through such agencies as the media. Outside of the rural press, very little is heard from the media about positive on-farm management practices and initiatives. Instead, the media tends to latch on to stories that present farming in a bad light. The public picks up on such stories, and thus frame the opinion that farmers ruin New Zealand's environment both for them and for future generations, ensuring a perception in the community that any policies that prevent or restrain farmers must be a good thing.[11]

In essence most of these policies seek to constrain major land use change, or to provoke change to less intensive land uses (such as forestry), unless beneficial impacts on the environment can be demonstrated. Over time, and without significant efforts by the industry to demonstrate to national and regional

[11] Reeves, op. cit.

government these beneficial impacts (and thus that such policies need review) it should be expected that use of such policies will widen to include all of New Zealand's sheep and beef sector.

Simply put, without moves by the industry to achieve the sorts of outcomes wanted by regulators, policies that constrain the ability of farmers to make their own resource use decisions will become unavoidable. Both regional and national governments would rather the issues were addressed proactively and voluntarily, but as yet the sheep and beef sector has come up with little coherent strategy that would alleviate governmental concerns. At the time of writing M&WNZ has developed an environmental positioning statement, but little in the way of specific goals and targets at which farmers can aim. As a September 2006 report on environmental initiatives by the agricultural sector pointed out:

> "Sectors such as meat and wool and arable that have more diverse value chains had no or minimal standards other than from individual processors and unknown levels of compliance... sectors, which lack cohesion and have no market drivers, are currently in the research end of the continuum and have only minor information provision initiatives. The meat and wool sectors are an example."[12]

Yet not being seen to move towards defined environmental goals carries a large element of risk. Internally, the government has already signalled that they will not allow New Zealand's clean green image around the world, on which we base much of our trade, to be put at risk, and will move to protect this image through regulation if they believe this is necessary.[13] Externally, and as this paper will discuss, affluent consumers around the world are beginning to demand proof that the goods they purchase have been produced in a sustainable manner.[14] Responding to these drivers is of critical importance to the industry.

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[12] Harris Consulting, The Agribusiness Group, & Ian Brown Consulting, Stocktake of Environmental Initiatives in Freshwater, pg 15

[13] Jon Manhire & Martin Emanuelsson, The Environmental Impact of Sheep & Beef Farming – A Review of Impacts and Research, pg 31

[14] Ibid., pg 27

1.2.3. Potential impacts of regulation

Regulation by regional councils of the sheep and beef sector has the potential to impact heavily on the sheep and beef sector, particularly as regards total production. The industry has been able to make up for land losses over the past 15 years by on-farm productivity increases. The types of policies being considered, ranging from reducing the amount of water used to irrigate, through to retirement of steeper land, coupled with the on-going land use change discussed earlier, will make this impossible given our current state of knowledge.

Lake Taupo is a case in point. There, farmers are being asked to reduce nitrogen leaching from their farms by 20% over the next decade. At the present time, few options are available to farmers to achieve this goal short of cutting back the numbers of animals they farm per hectare. They could invest in costly infrastructure items such as stand-off pads or feed pads coupled with effluent treatment systems, however given current returns such investments are currently an uneconomic proposition.

One of the major problems that the sector and the RCs must face is that, as things currently stand, mitigation tools available that are thought to help will only lessen profitability on sheep and beef farms. A recent report looking at the environmental and economic impact of various farm management practices thought to reduce the impact of emissions of nutrients to water found that none of these practices had a positive impact on sheep and beef farm profitability. Each of the models of sheep and beef farming used demonstrated a decrease in farm profit (with some of the mitigation tools themselves having little overall environmental impact).[15]

[15] The Agribusiness Group, Impact of Management Changes on Farm Profitability and Environmental Outcomes, a report prepared for the Water Programme of Action, April 2007

The other major problem that must quickly be addressed is the quality of the monitoring tools being used to analyse the impacts of individual farms, and what management systems can be put in place to help overcome potential impacts. As an example, the Overseer model is the current preferred tool for working out nutrient loss from individual farm systems. Yet as the model currently stands it struggles to cope with the diversity of systems, land forms, and contours of most sheep and beef farms, and thus the picture it gives is not necessarily as accurate as it needs to be. An OECD report released in 2006 claimed that we lacked reliable data on which to base policy decisions, failed to have national standards at which to aim or the information gathering systems and resources from which to provide reliable benchmarks.

The inability to intensify land use because of regulation in order to make up for land-use change will ensure that, in the absence of any 'silver bullets' coming from research and development (R&D), on-farm production must decrease in the years to 2020. The rate of decline will be determined, in large part, by what regulations are put in place to control land use.

Hand in hand with the above will be ever-increasing pressure on farmers to either reduce nutrient loads on farms, or put in place plans that mitigate any negative effects on the environment. It is not inconceivable that at some point in the future, farmers will have to be able to demonstrate that they actually improve the wider environment within which they farm.

In the years to 2020, and without any effort by the sheep and beef sector to forestall regulation by developing environmental management standards of their own that meet the needs of RCs, the industry should expect the following regulatory measures to be put in place:[16]

[16] These regulatory requirements are based on the implicit assumption that the industry itself does not quickly move to position itself as a champion of formal environmental management practices on-farm. It should also be noted that not all of these will be applied in every region at any one time, rather that a mix of these will be used, according to assessed regional needs.

- Widespread regulation with the aim of halting land use change, unless this change is to less intensive land uses. Forestry blocks must remain so, sheep and beef farms likewise, and so on
- Should a property want to change its land use, it will need to apply for a resource consent for this change, and be able to demonstrate positive environmental impacts by doing so
- More of New Zealand's class 6 & 7 land retired from farming, over and above that which farmers will retire voluntarily (in the Horizon's Regional Council area alone, the Council would like to see 200000 hectares of steep country retired from farming. At a conservative 6 ewes per hectare, this would reduce the national ewe flock by 1.2 million, or 3½%)
- Farmers requiring resource consents to apply inputs into their farming systems – such as fertiliser or irrigation
- Capping of nutrient and irrigation inputs
- Farms will require comprehensive Land and Environment Plans (LEPs)/and or Environmental Management Plans, along with RC auditing of these plans
- Produce yearly nutrient budgets and/or comprehensive Nutrient Management Plans, with copies of each available on demand to regional councils
- In the long term (post 2025), all farming will become a controlled activity, and thus all farmers will require resource consents to continue farming

The results of the imposition of such regulation on farm operations will be wide-ranging. Farmers will face much higher compliance costs than they do at the current point in time, particularly as regards additional time spent dealing with paperwork, and money spent obtaining consents and putting in place the types of environmental management systems that will be demanded by RCs.

Reducing on-farm productivity will also have potential negative impacts on profitability. If farmers do not receive higher prices to off-set declining production, and costs of production also increase, then profitability must fall. Hand-in-hand with this are the potential economic and social impacts on

regional economies, the biggest impacts of which will tend to be highly localised. For example, retiring steep land around the Taumarunui area, and thus reducing the amount of spending in the town by local farmers would have a huge impact on the township itself, being highly dependent on sheep and beef farming for its wealth.[17]

Structural change to farm productivity and profitability (as compared to the normal cyclical ebbs and flows) that results in permanently reduced incomes will also necessarily bring with it a decline in land values. If a farm is only able to produce 80% of its previous output, as an example, then it follows that, without any concurrent equal decline in the costs necessary to achieve this production, the resource upon which that output is based should only be worth 80% of its previous value. While such a decline would be a one-off correction, the impact on individual farming families affected by the drop in their equity would be devastating – image the impact of even a 10% overnight fall in house prices, to draw an analogy.

Meanwhile, at the same time that regional councils are considering policies that will, all other things being equal, result in falling levels of total production and increased costs on sheep and beef farms, the national government has signalled its intent to introduce legislation to combat climate change that threatens to add yet more costs to most farming systems.

1.3. Climate Change

The government's recently announced climate change policies have been designed to ensure that, at the very least, New Zealand meets the obligations it agreed to when it signed the Kyoto Protocol. When we initially signed the Protocol, it was assumed at that stage that, as a nation, we had reduced our

[17] As an aside, there is very little information and/or studies available that examine the potential economic and social effects of such policies at a regional or sub-regional level. Individual regional councils that are looking to use such policies are required under the RMA to consider economic and social impacts along with potential environmental benefits. Without such information and analysis councils run the risk of making poor decisions because of incomplete information.

levels of emissions below the 1990 benchmark. However, this subsequently proved wrong and New Zealand is currently estimated to be emitting over 20% more greenhouse gases now than we did in 1990,[18] thus the need for policies that ensured New Zealand could cover its commitment to Kyoto.

The three major sources of greenhouse gas emissions in our economy are derived from transport, energy, and pastoral agriculture. Of these, agriculture is by far the largest emitter of greenhouse gases, with 49% of New Zealand's total.[19] Compared to the rest of the developed world, this country's reliance on agriculture as the major driver of our economy means agriculture makes up a far larger proportion of emissions than other OECD countries.

The two main gases emitted by pastoral agriculture are methane and nitrous oxide. Methane is produced by the natural biological processes that occur in an animal's stomach during digestion, whereas nitrous oxide is a by-product of animal excrement and fertiliser. Both gases are extremely potent greenhouse gases – methane traps 10 times more heat than carbon dioxide, while nitrous oxide traps 310 times more heat.[20]

Thus as part of its climate change Plan of Action, in September 2007 the government outlined the means that they hope will ensure New Zealand more than meets its Kyoto commitments. As part of this strategy, the government decided: "to introduce a New Zealand Emissions Trading Scheme (ETS) that will cover all greenhouse gases and all sectors of the economy by 2013. Different sectors will join the scheme over five years [from 2008], allowing for a gradual adjustment to emission pricing."[21]

Agriculture will be among the last to join the scheme, joining on 1st January 2013, with the intent being to allow farmers time to adjust. However they, like other

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[18] Simon Terry, "Heat Treatment", Listener, 24/3/2007, pg 31
[19] New Zealand's climate change solutions: Sustainable land management and climate change, pg 1
[20] Catherine Hudson, "Its all hot air – carbon and climate change", *Consumer*, August 2007, pg 5
[21] New Zealand's climate change solutions, pg 1

sectors of the economy, will face higher costs in the meantime as the energy and transport sectors enter the scheme in 2008.[22]

The ETS is intended as a "cap and trade" trading scheme. This is one in which a limit or cap is put on the amount of greenhouse gas that any individual entity or sector can emit. They are then given credits that enable them to emit to a certain level – typically equal to or less than the amount that entity currently emits. If a sector or individual entity within the sector wishes to exceed their cap, they must purchase credits from someone that has credits to sell.

In the case of agriculture, it is proposed that each sector be allocated credits that amount to 90% of their 2005 greenhouse gas emissions. Individual farms within each sector will receive credits based on their 2005 stock numbers (although the details of exactly how this will be worked out are yet to be finalised at the time of writing).

As an example of how the scheme would work, Farm A emits 100 tonnes of CO_2 equivalents each year.[23] The level of emissions from this farm is now capped at 90 tonnes, and the farm is given 90 emissions credits (in other words, it may now only emit 90 tonnes of CO_2). If the farm wants to continue to emit 100 tonnes, it will need to purchase 10 tonnes from someone else. If it reduces its emissions to 90 tonnes, it won't have to pay anything, and if it reduces emissions still further to 80 tonnes (by planting trees, retiring land, or reducing stock numbers), it will be able to sell this 10 tonnes to another party.

The main reason why agriculture has been given till 2013 before it must operate under the ETS is that currently there are very few mitigating tools available to help farmers manage their emissions - or even an accurate methodology for the effective monitoring of animal emissions. The Pastoral Greenhouse Gas Consortium, a body set up with M&WNZ and government as two of its principal funders for the specific purpose of finding ways to manage on-farm greenhouse

[22] Ibid., pg 11

[23] Although the main farm greenhouse gases are methane and nitrous dioxide, all gases are converted back to their CO_2 equivalents.

gas emissions, has thus far been unable to develop any technologies that would help reduce methane emissions from livestock, although some promising lines of enquiry have been developed. The fertiliser industry has been able to develop and have recently begun marketing products (usually known as nitrification inhibitors) that slow down the release of nitrous oxide gas into the atmosphere or nitrates into groundwater. However, responses to these inhibitors vary widely depending on climate and soil temperatures and so may only be of limited effectiveness in some areas.

The government is also keen to promote the conversion of steep hill country from sheep and beef farming into forestry or native re-vegetation. One of the early pieces of climate change law to pass is the Permanent Forest Sinks Initiative (PFSI), which would see farmers that do retire or re-forest land being able to claim the carbon credits from such action which could then be sold on the open market. It is estimated that around 1.4 million hectares of steep land currently being farmed around New Zealand could be returned to native bush or forestry in this manner, which would take enough CO_2 from the atmosphere to cover New Zealand's current Kyoto liability.[24] This would have the additional benefit in both national and regional government's eyes of removing erosion-prone land from pastoral agriculture and thus help reduce the potential negative environmental impacts that this type of land use may cause.

1.3.1. Impact of Climate Change Policies

Without the development of successful mitigation techniques that farmers can apply on-farm, and again assuming all other things remain equal, the result of the application of the ETS in the sheep and beef sector from 2013 will be twofold – declining overall production, and increasing on-farm costs.

Production will decline as some farmers take advantage of the PFSI. Although no data is currently available, some of those farmers with pockets of highly

[24] Rebecca Macfie, "If not a carbon tax, what?", New Zealand Herald, Business Section, 19/3/2007, pg 3

marginal land, and/or those with existing pockets of unfenced bush, can be expected to retire or re-forest this land, and then sell the credits they will obtain by doing so. However, the amount of land retired for this purpose, and the income able to be derived from such pockets, may well prove to be less than anticipated. This will be determined by two factors; the cost of gaining the necessary certification in order to be able to sell credits, and the actual price of a traded unit of carbon on world markets.

Small parcels of land eligible under the PFSI will be more expensive to certify, certainly on a per hectare basis, than one large block. A farmer with small pockets (i.e. less than 10 hectares) on their farm that they would like to retire from grazing may find the costs of certification take the lion's share of any potential income they might be able to generate from selling credits on the open market. This would remove one of the incentives the individual farmer has to retire these blocks. What will determine the success or lack thereof of the PFSI will be the price of carbon on the open market. As the price rises, at some point it will become economic to retire smaller and smaller parcels of land. However, should the price of carbon fall (or sheep and beef product prices escalate), those farmers that have retired land will be unable to return the land to its previous use, potentially leaving them in a worse situation relative to other farmers.

Nevertheless, every hectare of land retired from sheep and beef grazing will mean a decline in production. As this paper has already discussed, it will be difficult, if not impossible, to make up this decline without new technologies that allow increased per hectare productivity at the same time as reduced environmental effects.

Currently, and assuming both that mitigation tools are unable to be found and farmers do not retire land, the application of the ETS scheme will add additional costs to farmers.[25] Using the 2005-06 season as a base, and assuming an average

[25] Those farmers that do retire land will, of course, lose income from the removal of part of their grazing land. Some of this loss will be covered by the reduction in their emissions.

farm size of 500 hectares emitting 8 tonnes of CO_2 equivalents per hectare per year, this will add $5000 to costs per farm on average per year.

However, it must be noted that these costs only apply at the beginning of the ETS scheme, when farmers will be given 90% of their emissions free. Over time farmers are required to continue cutting their emissions, so by 2025, they will have to cover the full cost of emissions. Thus every year farmers are responsible for more of their emissions, so every year their costs increase. Again assuming no change in emissions profile, by 2025 the full costs of the scheme would add around $60000 onto the average sheep and beef farm's yearly costs – assuming that the price of carbon is around $15 per tonne. Should the price of carbon rise to $30 per tonne, this would double the costs to $120000. Furthermore, volatile carbon prices could change farm costs dramatically, virtually overnight.

They could choose to purchase carbon credits from other parties in order to continue at the same production levels, but obviously this too will add costs to the farming system, is just as risky as regards carbon price volatility, and they will need to purchase ever-increasing amounts.

Thus the industry is left caught between a rock and a hard place. Farmers that choose to keep production levels at the same level in 2013 and onwards as they did in the 2005-06 season will see profitability fall due to increasing costs of production – and these costs will get steadily higher and higher. Farmers choosing to off-set their emissions through retirement of land will mean decreased total production for the industry, and reduced income for the individual farmer.[26]

Implicit in the Emissions Trading Scheme is the notion that the costs of such a scheme will be able to be passed on to consumers, and thus farmers will be no

[26] As an aside, MAF estimates that if a farmer retired 10% of their land area, and either planted this in plantation forestry or allowed native bush to regenerate, this would enable that farmer to cover animal emissions from the rest of their farm. Assuming the 10% retired is the worst land, the total breeding flock would decline by around 7% (this assumes the worst land does not have the carrying capacity of other land classes used for sheep and beef production).

worse off. After all, the goal from any such economic policy should be to influence *consumer* behaviour, and have this flow on into producer behaviour – they after all will be the group that determines whether a product is successful or not. In the case of the energy and transport sectors in New Zealand, indications are that electricity and fuel costs will increase. This will have a twofold effect; firstly, increasing prices for a good should see less of that good purchased by consumers, hopefully lowering overall emissions. Secondly, those companies that emit more than others (say a coal-fired power station versus a hydro-electric plant) will become relatively less profitable over time because they will have to purchase credits to continue emitting. This gives these companies the incentive to invest in cleaner technologies.

This works in a closed economy – one in which consumers are unable to purchase goods from other countries. It would be an expensive business should a New Zealand consumer wish to purchase their power from a company making that power in Australia, for example. However, one of the major hurdles with the ETS as it is applied to the agricultural sector is that the vast majority of goods are exported to other countries – 90% of all sheepmeat and 80% of all beef produced in this country is sold overseas. These products are thus exposed to competition from other countries, none of whom have implemented a scheme that covers emissions in agriculture. As such, this means our government has created an uneven playing field, with our products heavily disadvantaged against overseas competitors.

As none of our main trading partners have any emissions schemes operating in agriculture, this creates the very real risk to the sector that the price increases that the energy and transport sectors will be able to pass on to consumers will be impossible for the sheep and beef industry. For this to occur, the sheep and beef sector requires major changes that would allow it to pass on these costs to consumers. To do that, the industry needs first to understand market and consumer drivers.

2. Global Meat Market Trends and Conditions

2.1. Global Meat Protein Consumption Trends

World consumption of sheepmeat and beef is massive. To put things into perspective, in the 2005 year, New Zealand's total production of sheepmeat equalled just 3.8% of all sheepmeat eaten, while our beef production accounted for only 1% of all beef eaten. Throw in the other meat proteins, pork and poultry, and our relative lack of size becomes even more apparent – our lamb exports, for example, are less than 0.02% of meat proteins eaten. Our beef exports are an even lower percentage.[27]

And demand for meat proteins is growing. The enormous growth in the economies of rapidly developing countries, particularly in continental Asia, is driving up the demand for proteins. Generally this occurs first in cheaper forms of protein such as milk and milk products, helping to explain the surge in demand for dairy products that has driven the predicted dairy pay-out in New Zealand in the 2007-08 year. However, demand for meat proteins is predicted to boom in the next decade. Although consumption growth in OECD countries is predicted to remain relatively flat, in non-OECD countries, consumption of sheepmeat is expected to increase 35%, with beef consumption increasing some 24%. Again, to put these figures into some sort of perspective, expected growth in sheepmeat consumption over the next 10 years is the equivalent of 8 times our total production, while beef consumption will grow by a figure equivalent to more than 25 times our total production. In the upper-middle income countries alone, import demand of processed agricultural products (as compared to bulk commodities) is expected to continue growing at double-digit rates.[28]

As per capita incomes rise, the mix of foodstuffs contained in diets changes. People begin substituting cereals and other carbohydrates for the more expensive proteins, largely because they now have the incomes to be able to afford such

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[27] Figures derived from: OECD FAO Agricultural Outlook 2007-2016, and Compendium of New Zealand Farm Production Statistics, by Meat & Wool New Zealand Economic Service

[28] Ibid.

products which, relative to cereals, are far more expensive to produce. So countries like the rapidly developing economies in Asia, Brazil, and Russia, that are experiencing rapid income growth will lead the demand for food proteins over the next two decades. Yet developing countries have a very long way to go to match the per capita consumption of proteins compared to the developed countries. By 2020, the per capita consumption of meat in these countries is projected to be only 36% of that eaten by consumers in the rich world (although that has grown by nearly 30% since the mid-1990s). However, when looking at overall consumption, by the year 2020 62% of the world's meat consumption will take place in countries outside the OECD.[29]

Table 1: Global meat consumption

Projected trends in food consumption of various products, 1993-2020

Region/Product	Annual growth of total consumption, *1993-2020* (percent)	Total consumption *1993* (million metric tons)	Total consumption *2020* (million metric tons)	Annual per capita consumption *1993* (kilograms)	Annual per capita consumption *2020* (kilograms)
Developed World					
Beef	0.4	32	36	25	26
Pork	0.3	36	41	28	29
Poultry	1.0	26	34	20	25
Other meat	0.6	97	115	76	83
Milk	0.2	245	263	192	189
Developing World					
Beef	2.8	22	47	5	7
Pork	2.8	38	81	9	13
Poultry	3.1	21	49	5	8
Other meat	2.8	88	188	21	30
Milk	3.3	168	391	40	62

Source: Food and Agriculture Organisation of the United Nations, 2007.

Notes: Consumption refers to direct use as food, measured as uncooked weight, bone in.

Total meat includes sheepmeat and goatmeat.

Developed countries, on the other hand, can be termed mature markets in terms of meat consumption. That is, per capita consumption of meat products is not

[29] Christopher Delgado et al., Livestock to 2020 – The Next Food Revolution, pg 22

expected to change much over the next two decades. Consumption there has reached the point where increases in per capita income can not be expected to change overall demand for meat products on a per capita basis. However, what will change in these markets are buying decisions based on things other than the price of a product: "Consumption decisions in OECD countries will be to a greater extent driven by quality assurances such as traceability, meat-packing requirements and processing controls which re-inforce an underlying preference for premium quality meats."[30]

2.2. Meat Production Trends

The increase in consumption of meat protein products predicted over the next 10-20 years will need to be met by increased production. Current predictions are that this increased production will come from the developing countries. Far and away the country that is predicted to make up much of the difference is Brazil, where, by 2016, exports of meat products are expected to total more than the combined exports from the next four biggest exporters – the US, Canada, Argentina, and Australia. By this time, Brazil is expected to have 28% of total meat exports.[31]

However, as output increases in developing countries, the methods required to produce this additional output will change. Traditional extensive open-land grazing systems will not be able to handle the pressure of increased herd sizes. Already countries like China are seeing the results of too much stock pressure on delicate environments, with vast swathes of that country's interior being affected by desertification brought on through over-grazing of prairie lands. Grazing land in all countries around the world is coming under pressure from other land uses, in the main crop production and urbanisation, while additional lands are

[30] OECD-FAO Agricultural Outlook 2007-2016, pg 26
[31] Ibid.

the subject of preservation efforts, such as the Amazonian rain forest, which will constrain the ability of developing countries to expand grazing areas.[32]

Intensification of livestock production will be the key method of raising output. Generally speaking, this requires either intensification of current grazing lands, which only has a limited ability to increase output due to the potential negative environmental impacts this will cause, or the industrialisation of farming – in the main through feedlots. However, animals raised on feedlots require large amounts of feed grains in order to grow. In 2002, fully one third of the total global cereal harvest – 670 million tonnes - was fed to livestock. In the case of ruminants, use of these cereals for livestock was limited to those countries where meat prices are high relative to grain prices. In those countries that struggle to produce enough food – typically developing countries – grain feeding to ruminants does not occur to any great extent, suggesting that richer countries, and hence richer markets, are those that do feed grain to livestock. This has some interesting potential ramifications for New Zealand, and other grass-fed producers.

Using grains to feed animals for feed production is a relatively inefficient way of providing food. It takes around 10kgs of feed grains to grow 1kg of beef. In order to expand beef production by 1 therefore, feed grain fed to gain this extra unit of beef needs to grow by a factor of 10. However, there is a limit to how much land can be used for this purpose, driven by three factors; the amount of land available that must be used for other food crops, the yield from feed and cereal crops, and use of land for other purposes such as growing corn to make ethanol.

In the 2007 season, global fears about oil security and food stocks, coupled with droughts in some major grain producing areas such as Australia and the south-west United States, has seen cereal prices sky-rocket. Wheat futures traded at the Chicago Board of Trade have, in the space of a year, nearly doubled in price from

[32] Delgado et al., pg 19

US$3.98 a bushel to $6.42. Other cereals have followed similar price paths,[33] and thus producers dependent on feed grains to produce meat will inevitably see large increases in their costs of production, which necessarily will feed through into upward shifts in the prices they need to realise for their product.[34] Obviously this presents an advantage for producers, such as the majority of New Zealand farmers, which finish their animals using only grass. They will see higher worldwide prices, but retain similar costs structures that they have now (all other things being equal).

Continued competition for grain, particularly given the increases in world population that are expected, will see current feed grain prices stay at high levels in the immediate future. Meat production will be impacted in two ways; price increases for product, and possibly declines in per unit carcass weights. As an animal gets bigger, it requires more and more food simply for maintenance. Given higher input costs, feedlotters may choose to reduce the weights they finish animals to. Thus while global production of sheep and beef is expected to rise due to developing countries intensifying production, in developed countries total production may fall slightly – unless the price they receive for product increases enough to offset the rise in grain.

Thus in the years to 2020, global demand for sheepmeat and beef will increase, along with costs for the majority of producers around the world that use feed grains to finish their animals. Meat protein prices will rise because of these increased costs of production. As prices rise, New Zealand sheep and beef producers should benefit. However, these gains to the sheep and beef sector can be multiplied if the industry sets about understanding what affluent consumers around the world are looking for in their products, and then designing strategies that attract these consumers to purchase our products.

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[33] Rabobank Australia and New Zealand Agribusiness Review, pg 4

[34] In some cases producers may have been insulated from feed grain price rises in the coming season if they had forward purchased their inputs in the 2006-07 season, and thus product price increases may be slower to show the appreciation that has happened with cereal grains this year. However, the EU Commissioner for Agriculture has recently been quoted as expecting at least 30% increase in the price of pork and poultry in the EU in the coming year, virtually solely due to feed grain price increases. Given that lamb and beef are substitute proteins, it can be expected that these increases will feed through into these markets as well.

2.3 Consumer Trends

Although the previous section discussed global meat consumption and production trends, the key point for the New Zealand sheep and beef sector to remember is that while demand for red meat will grow, much of this growth will be in developing countries whose consumers, by and large, still will not be able to pay high prices for meat. Instead, the sheep and beef industry must target those consumers for whom the price of a product is secondary, and the factors that lie behind a product are primary, wherever these consumers are around the world. In short, the mission of the industry should be to aim to become the preferred supplier of red meat to the world's most affluent consumers.

2.3.1 Demographic Consumer Trends

The most important drivers of consumer trends are changes in incomes and therefore lifestyles, and demographics. They act as a pointer in the determination of whether meat markets overall will contract or diminish over time. Of these, demographic changes have arguably the biggest influence over the growth or otherwise of meat markets, especially when one considers these changes are also the main driver of lifestyle changes themselves.

Perhaps the single biggest demographic change since the end of the Second World War has been the growth of women in the workforce. Before this point it was highly unusual for a woman to be in paid employment outside the home. Roles were clearly defined along gender lines. The man went out and earned the family's income, while the woman stayed home looking after the children and running the house. Consequently she had time to cook meals such as the traditional roast, which frequently takes hours to prepare.

In the developed world, women currently make up over 40% of the paid workforce.[35] Hand in hand with this development is that with more women working, a family's purchasing power increases as women add their income to the family pot. Also, the so-called 'baby boomers', those children born in the two decades or so following the Second World War (and the largest segment of many OECD countries' populations) are currently in their peak earning periods.

Thus with more and more women in the workplace, gender roles become increasingly blurred, and household incomes rise. Neither of the two wage-earners have the time to prepare time-consuming meals. This has two outcomes. First, demand increases for foods that are quick, easy, and convenient to cook. Secondly, demand for meals prepared outside the home also increases.

Another demographic factor that impacts heavily on growth in this area is the growth in single person households. Again, these people do not have the time or the inclination to prepare complicated meals, and demand either meals purchased elsewhere, or frozen meals prepared elsewhere that can be quickly cooked and eaten. Indeed, one interesting aspect of the global building trade is that new apartments are being built that contain only microwave ovens in their kitchens, not conventional ovens. This is purely a reflection of demographic trends. People in some cases have no need of conventional ovens, and cooking is thus becoming a lost art form. Should they wish to eat at home, these people either microwave a dinner or order in.

The other major demographic factor driving consumer trends is the aging population. Population growth in most developed countries has almost ceased to expand, while the 'baby boomers' are rapidly reaching retirement age. Coupled with this phenomenon is that average life expectancies continue to increase. This indicates that, at least in developed countries, growth in total meat consumption will plateau. While meat consumption tends to increase in line with income increases (as people substitute protein for carbohydrates) meat

[35] US Department of Agriculture, *1988 Yearbook of Agriculture: Marketing U.S. Agriculture*, 1988, p99.

consumption is already so high in these markets that further income increases may have little impact on total consumption.

This is not true, however, of developing economies – particularly those in Asia. Marketers talk of points called 'magic moments.' These are points whereby people moving over them begin to buy entirely new categories of products. This type of phenomenon has been seen in the rapidly industrialising countries of Asia, where incomes have risen spectacularly over the past few decades. This has seen a more than proportionate increase in 'top quality' foodstuffs – meat, vegetables, fresh fruit, and dairy products as these magic moments are reached.

These demographic trends are the main drivers of changes in consumer demand for food products. However, other factors such as better consumer education and awareness of good health and eating habits, and environmental concerns also play a part in determining the types of product consumers demand. Taken together, these trends in consumer demand provide a blueprint that food producers must follow if they are to be successful.

As far as meat products are concerned, consumers make their purchasing decisions due to a number of different factors. The first relate to the product itself. Issues such as quality, packaging and portion size, coupled with factors such as convenience and versatility, are increasingly important to consumers. Other, non-product specific factors are also gaining increasing importance. These include such factors as the presence of additives in the product, the methods used in the production of the good - especially animal welfare issues, and increasingly environmental and climate change concerns.[36]

Quality of product is vital in gaining and retaining market share. As noted, the types of market segments our meat producers should be looking to are affluent, expect quality products and are prepared to pay for them. For the producer/exporter, these demands equate to producing an unblemished,

[36] Rodolfo Nayga & Daniel Waggoner, Competing in the Global Marketplace: Issues, Trends and Challenges Facing New Zealand's Sheepmeat Industry, p1.

consistently high quality product. Coupled with this is product presentation. Careful research is needed to ensure that such things as packaging and portion size are optimal for the target market segment. In many cases, families do not eat together, and have different meal-times. Hence portion size becomes critical if meals are for only one or two people, rather than the traditional family. For instance, chilled ready meals are among the fastest growing sectors of the retail market in the UK, although each meal may only contain 56-112 grams of meat.[37]

Convenience is a major driver of consumer demand. Food products have to be able to be cooked quickly, and either be pre-prepared or require little preparation. Convenience, and the necessity to save time, has also been largely responsible for the marked growth in takeaway meals and meals eaten away from home. Developed country populations are trending to graze rather than have set meals at set times, which is a function not just of demographic trends but also job demands. This accounts for the fact that the HRI trade is growing at a faster rate than the retail food sector.[38]

This trend towards microwave meals and the growth in the HRI trade has important implications for foodstuff producers. Due to the above factors, a generation is losing the skills to cook meat, while in certain economies – most notably Asia – some consumers in the preferred market segments even lack the necessary appliances to store meat.[39] Thus whole segments of target market populations are growing up not knowing how to properly cook meat and, more importantly, have no incentive to improve this knowledge. The implication for the meat industry is that it has to develop simpler, easier to cook food products to take advantage of these trends.

This point links nicely with the gradual decline in traditional meat meals – the Sunday roast being a prime example. As these have declined, so has the increase

[37] "UK likes ready meals", New Zealand Farmer, 21 November 1996, p3.
[38] P. R. Johnstone (Ed.), Twenty-Fifth Meat Industry Research Conference, July 1988, p108.
[39] Dr Andrew West, A Future for the Red Meat Industry, p83.

in exotic food consumption, as consumers seek new taste sensations.[40] While improvements in communication and travel mean that markets are globalising, so the influence of many different cultures is, at the same time, splintering these markets into smaller segments. Consumers are demanding novelty and entertainment value in food, and find this in unusual and exotic foods.

Yet arguably the most important trend in the future for the red meat industry, and at one and the same time both its biggest threat and greatest opportunity, owes very little to demographics or lifestyle changes. These are issues surrounding food safety, the environment, and climate change. As the globalisation of markets brought on by communication in all its forms continues, these will loom ever larger for food producers, with the potential to make or break the sheep and beef sector. Affluent consumers in developed markets, in particular, are demanding guarantees that the way in which a product has been produced and prepared ensures not only the safety of the product, but the safety of the wider environment – and they are prepared to pay to ensure these outcomes occur.

2.3.2 Affluent Consumer Trends

Consumers are becoming much more aware of not only the relationship between their diets and their health and welfare, but also their relationship with the global environment. Daily they are bombarded with conflicting messages about the benefits or otherwise of certain foods, and various companies' effects on the environment. Meanwhile climate change, and how it applies to food products, is arguably the most important consumer trend that will face the industry in the years to 2025.

These messages have created a new breed of consumers that are suspicious of all foods. Increasingly consumers want assurances that food is not only safe and

[40] This factor can be seen in any major city in New Zealand. 'Traditional' restaurants have been replaced by a raft of others featuring cuisine and tastes from around the world.

contains nothing artificial, but was produced in a stress-free environment, both in terms of the animal and the environment it was grown in. Just as importantly, food safety and environmental issues promise to become the tariffs and quotas of the new century. Consumer concerns over animal welfare and the degradation of the environment have the potential to replace such things as tariffs, quotas, sanitary and phytosanitary rules as barriers to trade.

Consumer concerns in the safety of red meat have been reinforced over the past 15 years following a series of incidents that highlighted the potential threats faced by meat producers and processors. Perhaps most damaging, especially to the reputations of beef producers worldwide, was the mass outbreak of 'mad cow' disease in Great Britain in the early 1990s, followed by isolated outbreaks in Japan, the United States and Canada. Added to this have been small outbreaks of the E.coli[41] virus in the United States, Europe and some parts of Asia. While the New Zealand meat industry may feel itself safe from problems such as these – and others such as foot and mouth disease – any incidence of such problems happening in New Zealand would be catastrophic for the industry.

Another important factor to consider is that consumers concerns may have basis in scientific fact. While in the case of 'mad cow' disease, European consumers concerns were well founded, in the case of growth hormones in beef they are not. When the EU banned US imports of beef because of US cattle producers almost uniform use of hormones, they did so simply because they were pressured to do so by environmental groups. Growth hormones pose no proven threat to humans, but consumers in the EU have chosen to reject this product despite reassurances by the scientific community that the product is safe. Similarly, debate is currently raging about genetically modified foods throughout the world.

Public concern regarding animal welfare issues is just another facet of the rise of food safety issues in the minds of consumers. Again, animal welfare issues have the potential to become a new barrier to trade in agricultural products,

[41] *Escherichia coli O157:H7*

particularly in Europe, with its strong environmental lobby. Indeed, due to public concerns about this issue, supermarket chains are now beginning to demand of their suppliers that they meet certain standards of animal care before they sign supply contracts. Requirements can include; no drugs except for necessary medical reasons, open and free grazing, lifetime information records of each animal, and so on.[42] Complete traceability of each animal through the supply chain is also being demanded.

All this helps explain the rise of what marketers describe as 'green consumerism'. As public concerns over food safety and environmental degradation continue to escalate, it is very likely that many high-margin markets around the world will 'demand guarantees that products are grown and processed to rigorous environmental standards.'[43] Food safety issues, in conjunction with demographic and lifestyle trends, offer the best indications as to the future needs and wants of consumers. The meat industry needs to anticipate and then produce meat products that mirror these trends if it is to be successful in global trade.

Of all the consumer trends, arguably consumer concerns around the environment and climate change are, at one and the same time, the New Zealand meat industry's biggest threat and its greatest opportunity. As global concerns regarding mankind's impact on our environment grow, so to does the growth in policies designed to achieve beneficial environmental or climate outcomes. Associated publicity campaigns highlight such policies – or their lack – and this feeds through into food purchase decisions by consumers.

Europe's affluent consumers in particular are leading the way. The 'food miles' campaign, and the subsequent on-going attempt to develop a methodology to determine the total carbon footprint of foods so that this information may be attached to the label, has been driven by consumers desire to purchase foods that

[42] Strategies for Agriculture in the 1990s, pg 29.
[43] Ibid., pg89.

not only taste good, but allow the purchaser to feel they are doing their part for the global environment.

"High value markets are increasingly insisting that minimum standards [of sustainable farming practices] are met. The ability to demonstrate compliance with defined standards is fast becoming a pre-requisite to supplying these markets, alongside traceability and quality control. Consequently, producers unable to prove compliance will increasingly be excluded from the most lucrative markets."[44]

2.5.1 Oligopsony and the Power of Supermarket Chains

One of the key factors that influences prices that a farmer in New Zealand receives for their lambs and cattle has nothing to do with the product or its manufacture, and everything to do with the buying power of major supermarket and HRI chains.[45]

Traditional methods of marketing meat products from this country essentially involved processing the stock, freezing the carcass and then placing the product in a container for shipment overseas. Once landed, these products would then be sold either at auction or to a distributor. Retailers would buy the product from the importer or wholesaler and then on sell it to the consumer. Over time, two main factors have slowly been changing this system. The first is the change in consumer demands, the second the change in retailing systems to take advantage of these demands.

The major change in food retailing systems since the end of World War Two has been the growth in power of leading supermarket chains throughout the world, coupled with the boom in HRI chains such as MacDonald's and Pizza Hut. In the US in 1997, supermarket chains accounted for nearly 80% of total food sales

[44] Rabobank Global Focus – New Zealand Agriculture in Focus, Summer 2007, pg10
[45] HRI = Hotels, Restaurants, and Institutions. Along with supermarkets, these groups are major purchasers of New Zealand red meat products.

in this sector, while the foodservice sector captured over 40% of the share of the food dollar. In the UK, supermarkets accounted for 85% of the total grocery market, with the top three chains totalling 53% of total grocery spending.[46] While the US and the UK represent two of the more advanced economies in respect to food retailing, other developed countries approach these levels in respect of retail market share, while developing economies are rapidly following suit.

Analysis of the food retail sector suggests trends that mirror the current scenario detailed in the above statistics. The first is that, over time, retailers will tend to become both larger and fewer in number as competition between foodservice sectors intensifies and economies of scale come into play. This is especially true given the very slow growth in aggregate demand for foodstuffs in developed economies as population growth rates plateau. As developing countries become more affluent, retailing systems will become more sophisticated over a greater range of markets throughout the world.

Of greatest concern to New Zealand's sheep and beef sector is the buying power supermarket chains, in particular, represent. The concentration of buying power in fewer and fewer hands, while the same number of sellers operate, strengthens the negotiating position of buyers. In economic terms, this situation is called an *oligopsony* – few buyers, many sellers. An oligopsony is defined as a market dominated by a few buyers, at least several of whom are large enough, relative to the total market, to be able to influence the market price.[47]

Sellers must sell product, buyers must buy product. However, when there are few buyers, it becomes easier for them to dictate the price they are prepared to pay. They know that they don't have to accept the price the first seller offers, as there are many others to buy from. On the other hand, a seller (particularly one selling a product with a limited shelf life) needs to sell their product. They also know that the buyer doesn't have to buy their product, and thus that the only

[46] "A window on the future of consumers and food", *Meat Industry Foresight Project 1998*, 1998, p19.
[47] Adapted from William Baumol et al., Economics – Principles and Policy, pg 617

way they will be able to sell their product is to lower their price. In essence, powerful supermarket buyers are able to play one seller off against another to get the lowest possible price. With very few alternatives available to them, the seller is forced to take this price, which in turn means they must lower the price they can offer to the producers of their raw material.

> "Firms in highly concentrated oligopsony markets are not price takers like farmers or consumers. They have power over price, and they use it to profit above and beyond the profit available from a competitive market."[48]

This type of behaviour becomes more difficult if the product being sold has some degree of differentiation from its competitors. Consumers that demand one product over others will ensure they buy only from those retailers that stock the product, and thus gives the seller of the product the power to choose which retailer to support. This denies supermarket chains the ability to play one seller off against another. As much as anything, the growth in supermarket chains selling their own-branded products is as much about preventing the above from happening as it is anything else. However, should every seller have a similar product, the only attribute that differentiates themselves from other sellers is price.

This is largely the case in the New Zealand sheep and beef sector. Essentially, the industry is trying to sell commodity products to supermarket buyers – goods that compete on price. Thirty years ago, the bulk of our lamb products were frozen carcasses. Today these make up a fraction of our exports. Instead we have developed a whole range of products of differing specifications. However, the important thing to note here is that individual companies have not differentiated their products from one another. The strongest New Zealand lamb brand remains the New Zealand lamb rosette, owned by the industry rather than one New Zealand exporting company. Therefore, a leg of New Zealand lamb

how

[48] Ronald W. Cotterill, What is the Value of Milk?, pg 4

from one company is very little different from a leg of New Zealand lamb from another company.[49]

When there are more than 20 New Zealand exporting companies trying to sell lamb products to a supermarket chain, that buyer is aware they can get virtually the same products, of the same quality, from any of the companies. Consumers are unaware of any difference between individual company products – to them New Zealand lamb is just that. New Zealand lamb is the brand. This allows retailers to quickly switch between companies selling the product, safe in the knowledge that the product itself remains the same. Thus power in the buyer/seller relationship remains with retailers, and New Zealand companies continue to be weak sellers. There are two solutions to overcoming this un-even relationship. The first is if a New Zealand company can differentiate itself from other New Zealand companies on the basis of factors other than the product itself, and build consumer loyalty in this product to the point where it is actively sought out by buyers (both consumers and retailers). The second is if the oligopsonic power of the supermarkets is matched by having few sellers.[50] However, neither solution is possible without major changes in the procurement and processing sector in New Zealand.

[49] Lamb is used as the example in this case. However, the same rules apply for beef. The key point is that the beef and lamb products sold by New Zealand exporting companies are essentially substitutes for one another. There is little differentiation between companies.

[50] Both these points will be examined in more detail in a later section

3. Producer-Processor Relationships

3.1 The Processing and Production Sector

To understand the current position of the sheep and beef industry, it is important to understand where this sector has come from. Current issues and problems in the sector can virtually all be traced back to the result of firstly the imposition of subsidies and their removal.

The removal of production subsidies and the resulting dramatic decrease in the amount of stock presented for slaughter placed immense pressure on the New Zealand meat processing industry to restructure their operations. These restructuring operations required vast sums of money from an industry that already struggled with low margins. Concurrently the decrease in stock numbers forced processors to offer premiums to producers to ensure economic levels of throughput through their processing facilities. Companies therefore concentrated their efforts on improving processing efficiency and stock procurement, solidifying their attentions on the processing, rather than marketing, end of the product chain.

The financial pressure that processing/exporting companies found themselves under reinforced the cost-plus mentality amongst meat companies that they had developed during the subsidy era. Companies had to ensure revenues at least matched costs otherwise they were headed for bankruptcy – as some did. Worse still, this financial pressure, which was also being felt by a great deal of producers, led to short-term thinking in all sectors of the industry - there was little point making plans for the next ten years if they weren't going to survive the next.

The problem that marketers faced in all this was that in order to improve company margins and thus survivability, they had to have financial resources to develop new markets. The government's catch-cry at the time was export-led growth, and they were exhorting companies to develop added-value products

that the world wanted and, more importantly, was prepared to pay for. The meat industry could and did develop these products, but the lack of financial resources hindered the efforts of marketers in expanding existing markets and, in particular, developing new ones.

As a consequence, the meat industry was slow in re-adjusting itself to take advantage of the higher value markets it had identified around the world, particularly in Europe and the rapidly expanding Asian economies. In essence, the industry found itself in a catch-22 situation; in order to make money it had to spend money, but to spend this money it first had to make money – a scenario very difficult in the years immediately following the removal of intervention. The precarious financial position of the processing industry severely limited the scope of exporters to invest in new processes, marketing and building market value.

Indeed, the requirement of parent companies to make money even had a negative impact on the long-term prospects of some markets. At certain times exporters diverted product away from developing markets to developed markets in order to reap short-term price benefits. For example, the United States beef market underwent somewhat of a price boom in the late 1980s and early 1990s in response to the ebb and flow of the US beef cycle. Relatively low prices for beef in the mid-1980s had seen a liquidation of the US beef herd, which resulted in a supply contraction during the above period and therefore a rise in price. During this time many exporters were attempting to develop new markets in Asia, but product was diverted away from these markets to take advantage of the higher prices available in the US.[51] Much the same sort of circumstance happened in the sheepmeat trade, with mutton diverted from Asia and the Middle East because of better short-term opportunities in Europe.

The key for all involved in the meat industry in the years following deregulation was risk avoidance. Uncertainty about the future led to short-term decisions in

[51] Diversion of beef from Asia to the US was also a product of the change in the way the meat industry in New Zealand allocated the US beef quota to various exporters. However, product diversion was also a factor of greater price realisation.

an attempt to improve security (and to some extent still does today). Processor/exporters, along with producers, strived to improve efficiency and productivity, while at the same time cut back on what was seen as less important expenditure. Just as farmers could not afford to spend as much money on fertiliser, exporters could not afford to increase their levels of spending on such items as market and product development. As Marianne Kelly, an industry analyst, pointed out in *The New Zealand Farmer* in early 1995:

> "Most companies have the ability to do more in the marketplace. A lot would like to do more but are frustrated in their efforts by lack of funds....Costs of taking the product beyond the CIF (cost, insurance and freight) point don't need to be high, but investment is needed in people who can service customers. New Zealand meat is often left 'naked' with little or no support. Present company investment in promotion is about $3 million on a CIF value of $1.5 billion in Europe or 0.2%, compared with the Danish Bacon organisation, which spends 1.3% on promotion in Britain alone."

3.1.1. Effects on R&D

Processors, because they were financially constrained, were unable to adequately invest in either R&D, product differentiation, or product promotion, which would bring about a sustainable rise in their economic performance. Research and development, both on products and markets offered perhaps the best ladder out of the morass the meat industry found itself in. As an example, the development of the Accelerated Conditioning and Aging (AC&A) process by MIRINZ in the 1970s enabled the industry to guarantee tender lamb to prospective buyers and helped lift the quality profile of our lamb products. However, due to problems within the processing sector, a lack of resources amongst processing companies and the gradual withdrawal of public sector R&D funding, funds were very short for investments either in processing or marketing R&D from the mid-1990s.

Processing firms had to solve the problems of providing a decent return to their (mostly farmer) investors, to invest in R&D to build a long-term future, and to remain competitive in the procurement marketplace in the short term, at one and the same time. Low margins on beef and lamb left processors needing to concentrate on maintaining high volumes, rather than product differentiation, to cover their high fixed costs. The need to focus on this and industry restructuring reduced processor vision to the here and now, rather than the longer term. Thus investment in R&D by meat companies dropped. No processors had monies available for adequate levels of investment.[52]

Companies also faced the problem of not being able to recoup all the benefits that resulted from R&D expenditure.[53] The traditional model for R&D expenditure in the meat industry, especially following deregulation of the economy, was for public sector funding to concentrate on, in the main, the production side of the industry, with lesser funding levels going into processing improvements. Much of this funding was channelled by Government through the New Zealand Meat Producers Board (NZMPB)[54] and thence to research bodies. Private companies concentrated on the marketing end of the chain, working back into the processing sector.

Products from individual companies are essentially the same, and companies share similar processing and packaging technologies. Therefore individual companies rightly saw a danger in spending money they could not afford on market R&D, trying to find and exploit added-value markets which gave a company the benefit of higher margins. A company could spend money finding improved markets for its products only to see another company from this country move in and, for a slightly lower price, offer exactly the same product to the customer.

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[52] *Meat Industry Review*, A Report issued by the Office of the Minister of Agriculture, October 1994.

[53] *Report of the Meat Industry Task Force to the Minister of Agriculture*, August 1983, p38.

[54] Although still in operation, much of the duties of the NZMPB, along with the New Zealand Wool Board, have been subsumed by Meat & Wool New Zealand. The main task of the NZMPB today is the issuing and management of quota in the US and UK market.

Industry analysts throughout the past two decades have called attention to the fact that while the industry spends between 1 and 1.5% of turnover on R&D, food companies overseas are spending as much as 7 or 8% of turnover in the same area. Yet this type of research does in large part determine the future shape and health of an industry.

Processor/exporters, even as they underfunded R&D, also denied researchers the information they required to get the best results from this investment, especially in terms of processing R&D. A report in 1996 claimed that the main impediment to improved research results was not any perceived lack of funding but rather that of a lack of leadership, communication and co-operation.[55] Their failure to do so could be put down to insecurity, both in terms of continued company survival and the ability of the funding provider to recoup the benefits from the research, and a lack of strategic planning from the companies involved. This reflected in a piecemeal approach to R&D - which in itself was a function of the uncertain nature of the industry following 1986. Any company operating day to day and week to week, cannot be expected to have developed any coherent long term plan for its R&D.

Despite some notable successes by the NZMPB in R&D - the Monitor Farm Programme being perhaps the best example – the level of R&D investment by the industry is mere tokenism given its size and importance. Much of the on-farm research done in this country is funded by farmers through a levy they pay on stock slaughtered. Declining stock slaughterings meant declining levels of funds available for R&D.

Investment in R&D is crucial in building a long term future for the meat industry. As already noted, however, both producers and processors have not had the financial strength to make much more than a token effort in this direction over the past 15 years. As a consequence, the meat research industry has lacked strategic direction, has been unco-ordinated, and has slowly

[55] West, op. cit., Appendix 4.7.1.

contracted in size as scientists look and move elsewhere to pursue their craft – with unknown repercussions for the industry.

3.2. Effects on Processor/Producer Relationships

The imposition and subsequent removal of subsidies from the meat industry created many negative effects within the industry, particularly in the marketing and processing sectors – problems that the industry is still coming to terms with today. Yet arguably the greatest problem in terms of the long term strength of the industry, and conversely the one area that has received the least attention and analysis, is that of the damage done to the producer/processor relationship.

From the time New Zealand began exporting meat products up until the present day, the method whereby producers supply product to processors changed little. Processors would simply advertise the price they would pay for stock in the various grades, and farmers would then choose to whom they would sell their stock. The grading system, virtually unchanged for decades, split stock presented for slaughter up into groups according to carcase weight and fat depth. As such, it operated as an averaging system, and offered little information to producers as regards the changing requirements of consumers at the other end of the chain.

Farmers – a strongly independent group at the best of times – had no incentive to be loyal to one processor. Given a choice of processors, many producers would simply supply the one that offered the best price. This system worked well while New Zealand concentrated on exporting frozen carcasses to our overseas markets, yet it had two big inherent faults. The first was that it did not encourage producers to be loyal to any one processor. The second was that because it was an averaging system, it denied producers precise information as to whether or not the stock they were presenting for slaughter was the right kind of stock the market required.

The lack of loyalty to processors is all the more puzzling because of the make-up of the processing sector. When exports first began, the great majority of processors were British owned. However, as time went on New Zealand farmers acquired more and more of the processing industry. This process speeded up somewhat following British entry into Europe and the imposition of quotas on New Zealand's sheepmeat exports to this market. The AFFCO and Alliance buyout of Waitaki's processing capacity, and the collapse of the British-owned Weddel processing company in 1994 completed this process. Until AFFCO turned itself into a public company, virtually all processing capacity in this country was owned by New Zealanders – even today, farmer-owned co-operatives make around up 70% of the processing sector.[56]

By definition, co-operatives are owned by producers. Yet the owners of these companies did not feel any obligation to supply the companies in which they had an interest, being far more interested in achieving maximum short-term cash flows. Consequently, an 'us versus them' philosophy arose between processors and producers. While this may have had its beginnings in the days when much of the processing capacity was foreign-owned, the switch to New Zealand ownership did nothing to alleviate the situation.

Therefore a relationship that should have been bi-partisan became bilateral, and the stock procurement market turned into a balance of power game. During the spring and summer months, when the majority of stock available for slaughter was presented, processors held sway. In autumn and winter, however, when stock supply slowed down, producers held sway. Processors did not have to worry about throughput so much in the spring and summer, and thus prices fell, with the opposite situation occurring in autumn and winter. Climatic conditions such as droughts, floods and snowstorms also caused swings in the balance of power.

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[56] It should be noted that the change of companies like AFFCO from producer co-operatives to public companies has also seen capital from both here and overseas come back into the processing sector.

Farmers, the owners of processors, considered that these companies would only pay as little as they could in order to get supplies and would not pay a fair price. On the other side of the equation, producers' attempts to get the best price on the day was seen by processors as abandoning the product at the farm gate.[57] These perceived problems ensured a dysfunctional relationship between producers and processors.

Overcapacity and industry restructuring, together with such events as the reorganisation of export quotas in the mid 1990s, conspired to reinforce and widen the gap between the two combatants, even though the industry had identified this as a problem that had to be rectified for its long term good. Indeed, since the late 1980s processors had been calling for much closer relationships between themselves and producers in order to maximise returns. These calls, however, fell on largely deaf ears.

Contributing to the poor relationship were failing meat companies. The collapse of Weddel and Fortex, the two major bankruptcies since deregulation, saw many thousands of farmer suppliers – not to mention trucking companies and other creditors - left out of pocket. Due to the fact farmers were unsecured creditors, they did not see a cent of monies owed to them by these companies for stock slaughtered in the weeks immediately preceding bankruptcy announcements. This heightened the institutional mistrust farmers held for processors. Comments by industry analysts that the overcapacity problem in the processing sector could see more companies going to the wall merely inflamed an already bad problem. Individual farmers had no way of investigating which companies were most at risk, and so in not knowing which companies were financially secure, could only mistrust them all.

In much the same way, processors could not trust their farmer suppliers. Overcapacity in the industry after deregulation forced processing companies into stock procurement wars, with large premiums being paid to suppliers to secure their stock. This reinforced not only farmers' desires to get the best price on the

[57] West, op. cit., p15.

day, but also the inward-looking focus of the industry. Co-operation between suppliers and processors for mutual benefit could never be improved on given this situation.

The most important point in all of this is that producers owned virtually all the institutions in which they were so mistrustful. Producers had allowed themselves to become divorced from the companies they owned, and the resulting relationship, with its legacy of wariness and mistrust on both sides, coupled with continuing overcapacity problems in the processing sector, has had marketing implications in the long term.

3.4. The New Zealand Meat Export Industry – The Current Situation

> "The New Zealand meat industry is multi-faceted, encompassing five distinct areas of activity including: 1) production; 2) processing; 3) transport; 4) marketing; and 5) farm supply. Each of these areas are critically dependent on one another for their own success and for the industry viability as a whole."[58]

Arguably the greatest current bugbear of the industry remains overcapacity of processing facilities. There remain a number of issues to be resolved. The first is a function of the dynamics of the industry. Simply stated, the processing sector is marked by low entry costs, high fixed costs and high exit costs. Thus it is relatively easy to enter the industry but relatively difficult to leave. As many older, less efficient plants were closed in the restructuring processes of the 1980s and 1990s, much of the effects this should have had in reducing the overcapacity problem was moderated by the establishment of new plants, the technological and efficiency improvements made to existing plants, and the reduction in stock numbers being farmed. As Table 4 shows, over time net capacity has not changed greatly.

[58] Nayga & Waggoner, op.cit., p37.

Table 4: Beef and Sheep Processing Capacity

Beef Processing Capacity

	1996-97	*2003-04*	*2005-06*
No. of Companies	13	18	17
No. of Plants	36	35	34
Total yearly kill	1962400	2337500	1973100
Max. kill per week	78704	77767	82962
Av. kill per week	37739	44952	37944
Av. as a %age of max. kill	48%	58%	46%
No. of weeks at maximum	24.9	26.8	25.4

Source: Meat & Wool New Zealand

Sheepmeat Processing Capacity

	1996-97	*2003-04*	*2005-06*
No. of Companies	18	23	21
No. of Plants	37	39	39
Total yearly kill ('000)*	30738	27482	28923
Max. kill per week ('000)*	1570	1418	1363
Av. kill per week ('000)*	591	529	556
Av. as a %age of max. kill	38%	37%	41%
No. of weeks at maximum	19.6	19.4	21.2

* = lamb equivalents (1 sheep = 1.15 lambs)

Source: Meat & Wool New Zealand

Without major structural change in the processing sector, overcapacity will remain a key problem, especially given that the major adjustment mechanism is company liquidation. Much of the reason for this is simply that unilaterally closing plants to reduce capacity and improve efficiency benefits the entire industry, not just the firm involved in the rationalisation. As a company receives

only partial benefits from such closures, these occur only if a plant becomes totally uneconomic, or if the firm collapses.

The other main, and related, problem on the production side of the industry is the inability of processors to secure a reliable supply of livestock, a factor not just of the overcapacity problem but also of the mistrust with which farmers and processors view their relationship. This constrains the ability of processor/exporters to focus on the final market for their products as they must first concentrate on securing an adequate throughput of stock. A survey of processors conducted when sheep numbers were rapidly escalating due to subsidies in 1982, concluded that the most difficult problem facing processors was the uncertainty surrounding their ability to access stock throughput.[59] Declining sheep numbers since that time have not improved the situation.

A secure supply of stock would enable the processor to take a much longer view of their prospects, and better plan their affairs. The ideal situation would be one where processors compete against each other for farmer suppliers on a year-by-year basis, rather than their stock on a day-by-day basis – much as the dairy industry does at present.[60] However, for this situation to occur, there must be a culture change in the production and processing sectors. Instead of combatants, the two groups must begin to view each other as partners.

The current state of the stock procurement market is still characterised by farm gate competition for stock. Given the overcapacity problem in the sector, processing firms still pay farmers premiums to guarantee stock throughput. These payments result in inadequate processor profitability, and drain them of the resources necessary to invest in the marketplace. Not co-incidentally, these activities reinforce the inward focus of the meat industry.

An additional reason for producers to contract more stock is that by doing so, more costs could be taken out of the system, some of the benefits of which would

[59] B.J. Ross, R.L. Sheppard, & A.C. Zwart, *The New Zealand Meat Trade in the 1980's: A Proposal for Change*, May 1982, p10.
[60] West, op.cit., p59.

be passed on to processors. Companies would be able to better match workforce requirements with throughput and would have a much greater idea of their storage and packaging needs, for instance. Perhaps even more importantly, they would then possess the information required to make the necessary decisions to close excess capacity. Given that they knew approximately how much stock they would receive in any given season, they would be in a much better position to make informed decisions as to their processing requirements.

All this is all quite apart from the marketing advantages that would come about as a result of more stock contracted. First is the stability that marketers of each company's products would be given. No more would they have to worry whether markets they have developed would be supplied with the appropriate amount of product. Instead they could concentrate on finding additional markets for the supplies they were now guaranteed, rather than the present case where they have to sell a certain proportion of product on commodity markets because they are unsure of product supply.

The paramount need for branded consumer foods is continuity of supply. Contracted stock supplies help guarantee a company's investment in the marketplace and offers the potential for the industry to step off the commodities merry-go-round. Industry stability would be enhanced, leading to increased investment both from outside and inside the industry, which itself leads to improved growth for all participants in the industry. Currently however, steps in this direction are moving only slowly.

Producers themselves, the owners of much of the processing sector, also lose with the current procurement structure. First and foremost are the potential long term financial returns available that they are foregoing by not forging long-term supply deals with a processor. One of the excuses producers use for not signing contracts has always been their reluctance to lose a degree of independence to make their own managerial decisions. Yet the only long term option available to processors should farmers continue their present management structures is to backward integrate. In other words to totally control the flow of stock from birth

through to the final product. This means they would have to own the means of production – the farms themselves. Although this is a drastic and, at the moment, totally unrealistic option given the present financial state of most processors, one only has to look at the huge American agribusiness companies to see the effectiveness of such a strategy.

Processors must also shoulder much of the blame for the lack of change in industry culture since the deregulation of the industry. While they have never been reticent in telling farmers what they need to do to improve the industry, they have been very slow in putting in place systems that provide the incentives for farmers to do so.

> "Marketing effectiveness is influenced by the structure of the meat industry. In terms of the procurement of suitable meat for marketing development, it is arguable that the 'averaging' effect of schedule pricing ... and the absence of direct contracting between producers and marketers blunts the incentive to farmers to produce animals from which effective differentiation of meat can be made."[61]

In effect, the current grading system describes animals in terms of their production variability rather than in terms of market specification,[62] and has been little changed since the advent of meat exporting from this country. Yet if the industry is to consistently produce meat that realises premiums in the global marketplace, it needs to develop a system that provides price signals to producers, rewarding their efforts in producing animals that meet the specifications of these markets, up to and including payments for environmental management. Producers are quick to respond to pricing signals sent out by processors given the natural constraints of the industry, with capital stock reproducing only once a year.

At the present point in time, processing firms do have in place systems that distinguish poor quality stock presented for slaughter. As markets and more

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[61] P.W.J. Clough, & E.M. Ojala, Competition Among Meats: The Place of New Zealand Lamb, p70.
[62] West, op.cit., p9.

importantly consumers have become more aware of food safety issues, so too have processors made farmers more aware of the need for high quality stock presentation. Farmers that send dirty or damaged[63] stock to processors run the risk of being penalised in terms of financial returns. Similarly, they have advised farmers of methods for handling stock that ensures animals are kept clean and with minimal stress. As part of Total Quality Management (TQM) systems, some processors are also 'licensing' trucking firms, and refusing to accept stock unless it has been transported by certain, approved carriers, or sending stock back to farmers if it is not presented in an appropriate condition. Yet steps such as these, while improving the situation, still do not address the central issue that, under the present system, farmers are still largely denied the incentives to make them change their management systems.

The single biggest problem with the current grading system is its lack of consistency. Those producers that do produce uniformly high quality stock that meets certain market segments are denied consistent rewards – largely due to the vagaries of schedule prices. Farmers cannot rate themselves according to industry best practise, simply because the procurement system denies them the ability to do so. The reality is that in any given group of farmers, the best among them in terms of producing stock that meets a processor's market specification may receive less for their animals than the worst farmer, simply because the poorer farmer sells their stock at a slightly different time when the schedule has appreciated.

The problem is that the schedule does not simply reflect the needs and demands of distant markets. Although based on overseas markets, a processor's schedule price for any given animal can also reflect its need for throughput, the time of year, competition from other firms, and other exogenous variables. Thus farmers are prevented from making accurate management decisions based solely on

[63] A reasonably common occurrence, especially in sheep, is for an animal's pelt to be damaged – whether by dog-bite, shearing cut, or another form of damage. Not only do these accidents damage the pelt, but they can also bruise the flesh underneath, downgrading the quality of the carcass.

market requirements.[64] The averaging effect of the grading and scheduling system acts as: "a significant disincentive to farmers considering investment in management systems and technologies to improve productivity, for their efforts would largely go unrewarded."[65]

The averaging system needs to change into one whereby individual animals are paid according to their market value – as currently happens all too seldom in the industry. Only in this way will producers receive the financial incentives to change their management structures to ensure that they do produce products that can be targeted at the highest value markets.

A system that emphasises, and appropriately rewards, meat production that does meet market specifications is not only necessary to improve on-farm performance and productivity, but also enables the industry to meet the changing requirements of retailers and consumers as regards food safety, traceability, and environmental management systems. Given the increasing importance of food safety in the eyes of consumers, individual processors need to take stock traceability schemes, in particular, a step further.

At present, processors assume – in virtually all cases rightly – that producers do follow guidelines laid down by the processor. This does not just involve the physical presentation of stock, but also such things as ensuring stock is emptied out before trucking, and is free of drench and dip residues. However, retailers are demanding complete traceability of individual animals from birth through to the finished consumer product, and in the future will audit not just processors, but their farmer suppliers. Thus processors need to be proactive and seek stock from those producers that do meet the standards laid down by markets.

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[64] The best example of this happenstance in recent years was the beef procurement war that occurred in 1993-94. Driven solely by processors' need for throughput, the schedule price jumped and producers began to increase the amounts of beef they produced. Thus they based their management decisions on information that reflected the needs of processors, not the needs of the market – which over the next two years dropped alarmingly.

[65] West, op.cit., p11.

This will require some sort of internationally recognised accreditation scheme, potentially along the lines of ISO14000 standards, whereby producers wanting to be part of it must be willing to undergo quality audits at any time to ensure compliance with market-derived guidelines. This is a logical next step on from the process that exporters have to undergo to satisfy their clients. Failure to do so has the potential to leave the industry in an exposed position as regards overseas markets, and also exposes the industry to attack from non-tariff trade barriers. One of the easiest methods for other countries to halt meat exports from this country would be simply to claim that producers do not produce their products in a safe and sustainable manner. Having producers audited by internationally recognised accreditation programmes would negate this threat, unlikely as it may be.

Changing consumer and retail trends have one other major implication for the production and processing sectors of the meat industry. This is that affluent markets demand supplies of product 12 months of the year. Although not so much of an issue for those markets that demand frozen product – as these product types can generally be kept in storage for extended periods of time – it is a major issue in those markets demanding fresh, chilled product. This is simply because although researchers in this country have made great strides in extending the shelf life of fresh, chilled product, the maximum period of time that it will keep is still only a matter of weeks, unlike months in the case of frozen product.

The dilemma for the industry is that typically, those markets that pay the most for our products, and those in which profits are greatest, are also those that demand chilled product for twelve months of the year. The problem is that the industry is very seasonal in nature, with the amount of stock presented for slaughter varying markedly month by month, and season by season.

This variation in supply can be linked back to the very reasons that New Zealand claims its competitive advantage in pastoral production. Unlike many other agricultural exporting countries, New Zealand has an advantage in that climate

and soil types combine to allow animals to be kept outdoors all year round, being finished on uncultivated grass crops. This is in direct contrast to some competing countries, where the climate is harsh enough to require animals to be housed indoors for part of the year, or for those countries with large feedlotting industries, where in both cases feed grains form the predominant part of an animal's diet.

However, these climatic advantages in raising stock have also meant that the meat processing industry in this country suffers from a considerable variation in supply. The bulk of much of New Zealand's grass is grown in the late spring, summer, and early autumn periods. These conditions allow producers to finish stock to processor requirements much more readily than at other times of the year – typically the late autumn, winter, and early spring periods - and thus supply of stock to processors usually peaks in the December-February period, falling off gradually during late summer and autumn as producers prepare for winter.[66]

Thus the industry is hampered by the fact that it, at present, does not maintain a consistent, year round supply of product. This in turn constrains the ability of New Zealand meat exporters to supply markets, denying the industry increased potential returns. The industry only has the ability to supply these markets up to a level determined by the lowest amount of product processed in any given week or month. In other words the amount of stock processed during the winter months in New Zealand represents the maximum amount of product marketers can sell to retailers on the basis of being able to supply the product year round.

As this discussion of the problems of seasonality generally relate to chilled product, it must be remembered that while the industry is constrained by the ebbs and flows of stock supply in this country, so too is it constrained by overseas trade barriers – notably in the case of chilled lamb exports to Europe. In this instance, the amount of chilled lamb the New Zealand meat industry

[66] West, op.cit, p6.

export's to the European Union is regulated by a gentlemen's agreement between the industry and the EU.

Before the conclusion of the Uruguay round of GATT in the mid-1990s, the amount of chilled lamb New Zealand could send to this market was regulated as part of New Zealand's total overall sheepmeat quota. The industry was only allowed to export around 10 000 tonnes of chilled lamb per year (out of a total of over 200 000 tonnes), although this amount did grow slowly over time. However, one of the outcomes of the GATT negotiations was that the EU agreed to abolish the quota on chilled exports, allowing the meat industry to export as much of the product as they wished to this market.

Yet since the GATT negotiations were concluded, the meat industry has only slowly increased the amounts of chilled product it sells to this market, for a number of reasons. The first is that, certainly in the period immediately following the Uruguay round, the industry was in no position to increase supply of the product. Processor/exporters in the main lacked the financial resources to develop new chilled markets, and at times had struggled to fill the old quota. The second reason is that the New Zealand meat industry, after prodding from the EU, had made an informal agreement not to rapidly expand chilled exports so as not to destabilise the market and antagonise the powerful EU farmer lobby.

However, both the sheepmeat and beef export sectors experience problems sourcing product for lucrative chilled markets. A study of exports of beef to Japan, conducted as far back as 1988, concluded that one of the greatest impediments to increasing market share in that country was accessing sufficient cattle in the off-season to maintain year-round supply, even though there were sufficient numbers of cattle suitable in New Zealand for this market.[67]

The solution to this problem is again for processors to offer contracts to farmers to supply those markets demanding year round supply, just as processors already do for the Christmas chilled lamb trade to the UK. Farmers supplying

[67] N.D. Fraser, *Impediments to Increased New Zealand Beef Trade with Japan*, August 1988, p31.

this market know in advance what sort of animal is required, when it is required by, where the product is going to, and exactly how much of a premium they will receive over and above the schedule price for any given week or month. Therefore they are able to make an informed decision as to whether or not they should change their management strategy and supply for this market. Farmers supplying year round markets would have, and need, much the same sort of information.

Just as importantly, an agreement between farmer and processor for the supply of stock helps negate the possibility of a bidding war for stock. Farmers supplying on contract are locked in, which prevents them playing off processors at the farm gate, while processors themselves – particularly those servicing these year round markets – have no need to enter bidding wars if their supply has been contracted. However, this requires contracts that are honoured (and there are numerous examples of both producers and processors not fulfilling contractual requirements in the past few years). In other words, producers must have signed an agreement to supply a set amount of required product to a processor at set times. In order for this to be attractive to producers, processors must guarantee a set price for this stock, attractive enough to convince producers to sign up to these contracts rather than take the best price on the day.

Processors may argue that offering a set price is impossible, given the instability of global markets. Yet the thrust of their marketing efforts should be in finding markets where price is only a small factor in the marketing mix, and where buyers want supplies of a certain product at certain times round the year at a guaranteed price. Therefore processor/marketers should find themselves in a position where the exchange rate is the only factor in determining a product's margin,[68] and given appropriate action to nullify exchange rate movements such

[68] As processors pay producers in $NZ, but generally receive payment either in $US or in the currency of the local buyer, if both the buying and selling price are set, then the only area a processor will be unsure of is the effect that changes to the exchange rate could have on a product's margins – given that they also know the costs of processing. The solution to this problem is to hedge against exchange rate changes. Doing so protects the processor from exchange rate losses, and helps isolate the processor from this element of risk – the only risk left in the chain if all other variables are set.

as purchasing forward exchange rate cover, should be able to guarantee prices to producers.

Given that prices offered by processors are attractive enough for out-of-season production, the seasonality problem of the industry will be lessened as farmers move to take advantage of financial gains. Similarly, offering these as contracts to producers will also help some aspects of the other problems facing the industry internally. Yet all this will be to no avail if the industry is not able to develop and build the right type of markets given prevailing retail and consumer trends.

The most obvious implication for the New Zealand meat industry given changing retail and consumer trends over the past few decades has been the need for the industry to change its focus. As this paper has already discussed, the industry started out producing commodity products for commodity markets. This, coupled firstly with government policies aimed at boosting production, and then overcapacity problems in the meat processing sector following deregulation, enforced an inward-looking nature on the industry. The consumer was a secondary influence whose demands needed to be met, but only if the industry had the resources to do so after it had dealt with internal issues.

The major implication of changing retail and consumer trends has been the realisation that the New Zealand meat industry is not in the goods producing business, but rather in the *customer satisfying* business. The industry's long term future revolves around how successfully it can change its focus from producing a good and then hoping someone will buy it, to finding out what the most affluent consumers in the world want and then delivering.

4. A Vision of 2025 – Where Will We Be?

The current state of the sheep and beef sector is characterised by a lack of a clear vision. Industry-good body Meat & Wool New Zealand, as the farmer voice for the industry, is the organisation best positioned to enunciate this vision, and develop the framework within which farmers can move to position themselves to achieve it. However, the leadership and drive to understand what the future holds for the sector – both internally and externally – then to set in place systems, processes, and strategies that ensure the sector is able to stay ahead of likely changes, has not yet been seen from M&WNZ.

Like the rest of the industry, M&WNZ has tended to be short term in its thinking. Every five years, farmers hold a referendum to decide whether to give this levy-funded organisation a mandate for a further five years, so a degree of focus on the here and now is perhaps understandable. However, the purpose of M&WNZ is to protect the interests of sheep and beef farmers in the long term, and help them to prepare for the future. To lead, rather than follow, the industry. A failure to have a long term vision and associated strategy condemns the production side of the industry to being reactive, not proactive. This carries the obvious danger that, as this paper has noted, farmers end up with processes controlling them, rather than them controlling the processes.

Developing a long-term vision provides a clear focus on the steps necessary to achieve this vision. This allows such things as R&D, trade policy, and technology transfer to have a logical progression, and simplifies short-term planning and budgeting. Furthermore, it also allows clear targets to be set, and progress against targets checked.

The remainder of this paper is dedicated to setting out a vision, and the steps required to achievement of this vision. It will build on industry threats and opportunities identified in earlier sections, and suggest policies and strategies that make the most of the changing environment in which the sheep and beef sector will find itself in the years to 2025.

Vision – By 2025:

For the New Zealand sheep and beef sector to be the preferred supplier of red meat products to the world's most discerning customers.

4.1 Key Internal Threats

Internal threats to achievement of the above goal can be categorised along two separate, but inter-related lines. The first are exogenous variables in New Zealand that affect the sheep and beef sector. These are regional and national regulation of the sector, and land use change brought on not just by regulation but also by competing land usages. The second are variables relating to the sector itself, and can be loosely grouped under the heading internal relationships.

4.1.1 Exogenous Variables

Over time the sheep and beef sector will decline in size. Over the past two decades total land area used by the sector has declined at a rate of approximately 1% per year. In the past land use change out of sheep and beef has been largely caused either by retirement of land into forestry or native bush, or the movement into dairying. Given respective returns available, the latter cause, in particular, can be expected to continue at a rapid pace, particularly in the short term. Given that conversion to dairying occurs on better pastoral land, this will mean a disproportionately higher percentage of sheep and beef cattle will be removed from the national flock. So while the industry can expect to continue losing land at a similar rate over the medium term, potential changes to total sheep and beef numbers can be expected to be higher.

While these losses will be incremental in nature, declining land area for sheep and beef production will be massively affected by government's decision to

implement an Emission Trading Scheme in agriculture from 2013. The cost to the industry will be enormous. At best, and assuming farmers choose to offset their on-farm emissions by retiring land and planting trees, and that this means a minimum of 10% of every farm must be retired from pastoral use, then 10% of the industry's land area will be removed from production. Should farmers choose instead to pay the costs of their emissions, and assuming a carbon price somewhere between $15-30 per tonne, by 2025 farmers will be wearing an additional $60000-120000 in costs per year.

These costs are sunk costs, in that, all other things being equal, the individual farmer will recover virtually none of these payments from the marketplace. Since 1990, average farm net profits have never once been over $120000, while in the 15 years to 2005-06, farm profits have only exceeded $60000 4 times.[69] In essence, this means that even if the price of carbon is $15 per tonne, the average sheep and beef farmer will, after 2025, not make any profit.

Thus it is likely that farmers will choose to retire land to off-set their emissions. The 10% of land that will be retired will see declines in total sheep and beef numbers by around the same figure. Previous declines in total sheep and beef numbers due to land use change have been offset by on-farm productivity increases, to the point that total production from the sheep and beef sector has hardly changed. In this case however, should farmers choose to retire land, any potential increase in productivity will potentially create more emissions, and thus attract higher carbon charges.

Local government regulation will, in any case, likely make intensification of farmland virtually impossible. By 2025, it is likely that rules will be in place throughout New Zealand aiming to control nutrient outputs from farms. Again,

[69] Meat & Wool New Zealand Economic Service. The Emissions Trading Scheme, and its potentially flawed design, is covered in more detail in Appendix I of this paper. For now, remember that currently there are no mitigating technologies that farmers can use to reduce methane emissions. Thus it seems a very risky exercise to base an economic policy with the potential to destroy one of New Zealand's most important sectors on the premise that we might be able to come up with something before farmers feel the full impact of the ETS. Even if we do manage to develop new technologies, no-one knows what this will cost farmers to use or introduce.

all other things being equal, this essentially prevents any increase in numbers of stock carried per hectare. Indeed, in all likelihood these rules will force a decrease in stock numbers to ensure reducing nutrient loads leaving sheep and beef farms over time.

The industry should also expect to see further regulatory moves that aim to retire mainly steep, highly erodable land from pastoral production. Presently, regional councils are pressing farmers to voluntarily retire such land. However, inaction by sheep and beef farmers will result in moves towards a regulatory framework that ensures such land retirement becomes obligatory. Again, such moves will result in declining stock numbers.

The years to 2025 will also see further regulations based around water quality and quantity issues. By 2025, aside from that used for stock watering, water used for irrigation purposes will be limited, and in all likelihood use of this water will incur significant cost. Similarly, regulations designed to improve water quality, such as the fencing of all streams to prevent stock access, will be put in place across the country. Finally, in most cases farmers will require resource consents to farm, further adding to sunk costs on-farm.

Therefore, all other things being equal, the years to 2025 will see rising cost structures on sheep and beef farms, coupled with declining total production from these farms. Assuming no major technological breakthroughs, the industry should expect production to decrease by around 1% per year, while on-farm cost increases will largely be determined by the price of carbon in any given year.

4.1.2 Internal Relationships

The single biggest internal threat in the sheep and beef sector is overcapacity of processing facilities. Currently, if every plant in New Zealand operated at 100% capacity, the industry could process every cattle beast presented for slaughter in 25 weeks, while it could process every lamb presented for slaughter in just over

21 weeks.[70] This forces the industry to focus scarce resources on the procurement, rather than marketing, side of the industry. It creates too much competition for stock, squeezing company profitability and preventing any long-term focus on improving returns.

Overcapacity results in the inefficient usage of fixed assets, resulting in per unit fixed production costs higher than they otherwise need to be. Per unit variable costs are also higher, due to each company having to spend additional resources on stock procurement. Simply put, overcapacity leads to inefficiency.

Like the dairy industry, the sheep and beef sector does need to operate with a certain amount of excess capacity in its processing facilities. Given the seasonal nature of New Zealand's climate and the resulting grass growth curve, stock production will always peak in the late spring/summer period. However, it is clear the industry suffers from an over-investment of scarce capital in production facilities. It also creates absurd situations such as stock trucks, loaded with similar animals, crossing in opposite directions on New Zealand's main roads as they head to different processors – another example of inefficiencies in the procurement and processing sector.

Given potential land use changes and declining total production from sheep and beef farms in the years to 2025, it is clear that, certainly in the short-term, overcapacity, and the inefficiencies that stem from it, can only get worse. As supplies shrink, competition amongst processors will become ever more fierce – again taking the focus, and with it a large amount of resources, off the marketing end of the supply chain.

Without major change in the processing sector, the only ways to fix the problem is if either a company unilaterally closes down surplus processing plants, or a processing company cannot handle the competition anymore and goes bankrupt. In the past this often meant another company would purchase the processing facilities from the receiver, and then open them up again. However, after the

[70] See Table 4.

demise of Weddel Crown, a large British-owned processing company, in the 1990s, North Island processing companies formed a consortium, bought the processing facilities and permanently shut them down, providing a good model of how to ensure surplus capacity can be removed from the sector.

Companies will not unilaterally close plants (unless a company has a hugely inefficient plant with excessive costs), because of a problem economists call 'free riders'. The only incentive to a company to close down surplus capacity is if this company is able to gain 100% of the benefits from doing so. However, if the company can't capture all of the benefits, this means other entities receive benefits without having to pay for them – hence the term. Should a processor unilaterally close down a facility and remove capacity, thus reducing some competition for stock, all other processors benefit.

This problem is exacerbated due to another major internal threat – a lack of loyalty from farmers, unprepared to commit production from their farm to one processor. An individual farmer is a producer of commodity products, and thus farmers are price takers. However, farmers that play off two or more processors, take the best price and then simply abandon their product at the farm gate, help ensure that it is difficult for processor-exporters to act any differently in overseas markets.

This abandonment may well prove to be their undoing. The M&WNZ Monitor Farm Programme is a wonderful example of how well farmers are prepared to work together, and share information and ideas so that all may benefit. Unfortunately, this willingness to work together for the common good stops once farmers move outside the farm gate. As such, the risk is that farmers become 'peasant' farmers, in that all they become is a supplier of a raw material. Instead of the product being owned by farmers right through the supply chain to the final consumer, in essence they become independent contractors - usually the last to get paid, and receiving whatever is left after everyone else in the chain has taken their piece.

The essential problem is that sheep and beef farmers have not demonstrated any great willingness to invest outside the farm gate. Whereas the average dairy farmer has $33 out of every $100 invested in downstream businesses so that additional wealth can be created outside of the farm, the average sheep and beef farmer has only $6 invested. Simply put, if you believe that you produce a fantastic product, it makes sense to ensure that you invest in taking this good to market, and ensuring that consumers are aware of its qualities. Farmers talk of others in the supply chain 'clipping the ticket' – taking a margin on the way through. Ownership of the product through to the final consumer ensures that farmers collect these margins.

Individual farmers do not have a large investment in single processor/exporters, and so lack any incentive to supply one company, yet security of supply is paramount to a successful food business. It allows the most efficient and cost-effective use of fixed assets, while also enabling downstream sectors to perform their jobs more effectively. Too much competition for stock, particularly in the short run, prevents any sector of the industry from making long-term decisions.

Downstream investment by farmers is difficult given current low profitability levels. Low profitability encourages short-term thinking by farmers, increasing the incentive for them to take the best price on the day, while lowering their abilities to invest further in the industry. It also speeds up land use change out of sheep and beef, as landowners look to other types of land use that will generate better income streams. Working far more closely together offers a solution to this problem, yet both the processing and production sectors have had two lean years, exacerbating tensions between the two and making better co-operation more unlikely.[71]

[71] It can be argued that another major threat to the industry is *good* profitability. In all likelihood, the real price of red meat products will rise significantly over the next few years in response to much higher feed grain prices. This promises to lift returns for sheep and beef farmers here in New Zealand, and would dilute much of the current impetus for change in the industry – change needed to improve the long-term positioning of the sector.

4.2. External Threats

Ultimately, success for the sheep and beef sector resides on performance at the consumption end of the supply chain. A failure by the industry to recognise and respond to threats posed by retailers and the demands of consumers will ensure poor performance, which will then be felt by the industry at home.

4.2.1. Oligopsony

The relationship between large supermarket retailers and New Zealand exporters is crucial for the industry's success. Currently, this relationship is heavily weighted in the favour of supermarket buyers. Many sellers of the same product but only a few buyers create a situation where the buyer is able to dictate the terms of any arrangement. Just as with individual farmers in New Zealand, in this situation New Zealand exporting companies become price takers, rather than price makers. With little control, exporters have low bargaining power when dealing with buyers. In the medium term, there is little likelihood that any single New Zealand exporting company will be able to differentiate its products enough to remove itself from this relationship.

The industry needs to recognise that (and this is particularly the case for lamb), even though they may have added value, what we sell is actually a commodity. Our problem is that we have created a brand – the New Zealand lamb rosette – that has very high brand recognition amongst consumers, but we have diluted the power of that brand with retailers because its use is dispersed across many exporters, all of whom are in competition with one another to sell the same product. Hence retailers are able to access 'New Zealand Lamb' from a wide variety of different sources.

The very excellence of our production and processing systems works against us. Potentially the industry would be better off if we had a wide disparity of

processing systems delivering very different levels of quality. At least in that case retailers would not be able to play one exporter off against another because the products would be different! However, both farmers and the processing sector produce a uniformly high quality product, allowing retailers to dictate terms.

Individual exporters need to create demand for a particular product not just from consumers, but also from retailers. Ideally the aim is to reach a point where retailers (and the large HRI chains for that matter) actively seek out the exporter because consumers demand that retailers source the product. In this manner parity will be regained in the exporter/retailer relationship. The other way to regain parity is to dramatically reduce the number of exporters selling to retail chains. If the product being sold is a commodity, the model offering the best potential return to the industry is one seller, forcing retailers to deal with only that one entity.

4.2.2. Consumer Demands

The threat from affluent consumers is not so much that they won't demand red meat proteins, but rather that we will not meet their demands for the standards and systems they want to see in place behind the product, and so they will buy their red meat from a supply chain that does have these standards and systems. The world's affluent consumers don't simply want a great tasting, easy to cook product. They want to know that purchasing the product is good for them, it is safe, and that it will be good for the planet.

New Zealand has a natural advantage over most of the developed world in this regard. The vast majority of our product is raised on grass and is kept outdoors all year round. To all intents and purposes, we produce 'free range' red meat products. New Zealand itself is marketed to the world on the basis that we are clean and green – huge vistas showing clean flowing rivers, open green pastures, and snow-capped mountains. The country and its products are associated with a

wonderful natural environment.

The threat to the sheep and beef sector is if we are found to be selling products on the basis of being clean and green with no foundation in actual fact. While most meat companies are now beginning to require farmers follow a set of guidelines around such activities as animal welfare, stock handling, and animal health and pest control residues, very few make it mandatory that farmers operate under some sort of Environmental Management System (EMS). Currently New Zealand boasts only a limited number of agricultural market sectors, such as kiwifruit, that make it mandatory that farmers supplying these sectors follow set environmental guidelines. Typically the sectors that do are those already delivering branded products to consumers, and the major reason they do so is because they see a competitive advantage from it.[72]

Process attributes – health, safety, and the way in which food is raised and processed – is *the* key consumer trend in affluent countries. Consumers in most developed countries, and wealthy consumers in developing countries, are increasing their consumption of foods that are quality assured.[73] Many are now beginning to go further, with European consumers in particular demanding more and more robust environmental credentials from producers.

The sheep and beef sector does not have a very strong case to make on most of these attributes. Thanks to a long history of being seen to produce a high quality, safe product, the industry has been able to get away, up till now, with trading on the image and reputation of our farming methods and processing systems. However, the industry has little in the way of on-farm audit systems that would assure either retailers or consumers in developed countries that we do what we say we do. Again, the industry tends to sit back and react, rather than be proactive – to wait until something happens before rushing to try and fix it.

A case in point are full traceability systems. The ability to trace an animal from

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[72] Harris Consulting et al., Stocktake of Environmental Initiatives in Freshwater, pg 20.
[73] www.ers.usda.gov/Briefing/GlobalFoodMarkets/consumer.htm

the plate all the way back to the paddock in which it was born, and do so quickly, is becoming increasingly important to retailers and the HRI trade, because they want to be able to assure their customers that the products they buy are safe. Traceability itself is potentially a key point of difference between sheep and beef products from New Zealand, and those of potential competitors. Instead of seeing the opportunity to use and market this difference, the sheep and beef sector has dithered for a number of years around process issues, despite recognising the need for a system to be put in place as quickly as possible. Put another way, should some of our product be found to contain a potentially harmful agent and we are not able to quickly trace this problem back to source, our customers would very quickly lose faith in our products.

Growing global recognition of the importance of climate change is manifesting itself in increasing affluent consumer demands for carbon footprint information to be clearly marked on products they buy. Again, the threat here is if we do not respond. In this case New Zealand's sheep and beef products display a clear advantage over goods produced in other developed countries in terms of total energy expenditure,[74] and so provide the industry with another clear opportunity to differentiate ourselves from competitors and create demand for our products from affluent consumers. However, in order to do so, again we need certified energy use records (potentially both at industry average and individual farm levels) to demonstrate what energy is expended in the production of a product.

The years to 2025 will thus be characterised by increasing demands on foodstuff suppliers. Consumer demands for robust, audited systems that demonstrate good land and animal stewardship will increase, together with proven evidence of emissions reductions. Complete traceability of all foods will be a requirement to access affluent markets, while those goods that have proven health and well-being attributes will have an advantage.

[74] See Appendix I.

4.3. Strategies

> "The meat industry had made great strides in developing relationships with retailers and the food service sector and in creating a New Zealand lamb brand. But, New Zealand and the meat industry were too small to fragment that brand further and to be anything less than a united and cohesive industry. 'There is a lack of cohesive leadership in the industry and farmers need to be made aware of or better understand models and where they are taking the industry in the future.' He [Keith Cooper] described the farmer-elected body Meat & Wool New Zealand as a 'neutral referee' rather than demonstrating leadership... Meat processors and exporters, meanwhile, were closeted in their own groupings to the detriment of their business... Fonterra, by comparison, had well-resourced producer, processor and exporter representative structures which were focused on the future of the industry. 'Whereas, the meat industry hasn't got a single industry perspective and operates in a cellular structure. The world had moved on, and instead of in-fighting, the industry needed to unite to develop markets, secure market access, fund research and development, and get political representation.' " - Keith Cooper, CEO of PPCS, talking to Neal Wallace.[75]

The comments above, by the CEO of New Zealand's largest meat company, are illustrative of the problems currently surrounding the sector. Given the threats to the industry, how does the industry overcome these and achieve the vision of being the preferred supplier of red meat to the world's most discerning customers? Too often in the past, studies look at the structure of the industry first, before looking at strategy. Yet if the aim is the best long-term outcome for the industry, then it makes better sense to first focus on what this outcome will

[75] Neal Wallace, "*PPCS chief sees fragmented meat industry*", Otago Daily Times, 10/3/2007, pg 25.

be, and what the industry needs to put in place to achieve this outcome, before worrying about what structure best suits.

To begin, exactly what does it mean if we say we want to be the preferred supplier of red meat to the world's most discerning customers? Simply put, this means when an affluent consumer is planning to purchase red meat, they automatically think about purchasing New Zealand beef or lamb, and will seek out those retailers that stock the products. They are aware that by doing so this not only guarantees them a superb eating experience, but also that they have made the planet better off. They feel good about buying our product.

Wealthy consumers tend to be far more price in-elastic than other consumers. This simply means that they are not so sensitive to price increases and decreases because they don't have to worry as much about balancing their budget. If they want a product, they simply go and purchase it. This allows a degree of price flexibility, and thus can help cushion the impact of exchange rate movements. Therefore these are the consumers we should aim to supply. However, these are also consumers who, while they are happy to pay more for a product, expect certain things from that product, over and above what another competitor may produce.

The goal of the New Zealand sheep and beef sector is simply to be recognised as 'the best' - the best red meat products in the world. This means having the best and most consistent eating quality, healthy products, world best animal welfare, production, and traceability systems, world's best Environmental Management Systems (both at on-farm and processor level), and carbon neutrality at worst. Most importantly, we need these systems operating before we can begin the most important phase – selling this message to the consumer. We need to build in consumers such brand awareness and loyalty in New Zealand red meat products that retailers and HRI chains must stock our products, or lose custom to those others that do.

To focus firstly on the requirement to have a superb eating experience, this means that 100% of the time a customer purchases New Zealand beef or lamb, they know the product will be tender, juicy, and delicious, and that the product will be healthy for them. All it takes is one bad experience and a consumer will not purchase a product – even worse, they will probably tell their friends about it and potentially put them off purchasing as well. So processes must be developed and/or refined to ensure this never happens.

An example of how the industry could be tripped up is the industry's practice of using older ram lambs. Meat taint caused by hormones becomes evident as these animals mature, and can ruin a dining experience, although some consumer market segments may enjoy the gamier taste. Thus the industry needs to develop a date, after which time ram lamb will not be sold as lamb, or the industry simply brands ram lamb products differently from ewe or wether lambs.

Use of growth hormones in cattle is another case in point. Although humans eating beef that has been grown with the aid of growth hormone have never suffered any known harmful effects, imports of such beef into the EU is banned, simply because the consumer lobby wanted it so. Growth hormones are used in New Zealand to a limited extent, but should the industry use products that are seen as not 'natural' by a large section of our total target market?

4.3.1. Strategies - Marketing

Short of a drastic change in the processing/exporting sector, in order to capture more product margins, it is necessary for exporting companies to work much closer together, although care needs to be taken to avoid any hint of collusion that overseas governments would seize on and punish. The recent announcement of a joint M&WNZ-exporting company initiative to investigate potential marketing opportunities in Asia is a positive move. Nevertheless, the issue at hand is that in order for such joint initiatives to work, each company

must remain loyal to the agreement, and risks are potentially high that one company will break away from the group if it sees an opportunity.

However risks to achievement of the vision are multiplied if the industry has a fragmented marketing plan. Branding under a New Zealand Pure label (or something like this) assumes that all sheepmeat and beef products are sold under this label. This requires, at the very least, a co-ordinated approach to marketing. One company selling under a different label will potentially only add confusion to the marketplace and dilute the power of the brand.

Following on from this, should a company sell similar products in the same market under a different brand, the net result could well end up being the same as the industry currently sees in markets such as the UK lamb and US beef markets – New Zealand companies forced to compete against each other on price. There is enough competition already from overseas products without New Zealand companies fighting it out for market share.

There are a number of strategies the industry should employ. First and foremost, the industry needs to embrace country of origin labelling. The reason for this is that we don't just want to sell a product – we want to sell all those things that go together to make us the best red meat products in the world, and we are also selling New Zealand and its unique attributes. This country has been sold to the world for many years now as 100% pure. The sheep and beef sector can and should leverage off this image.[76] If we produce the world's best products, then we should want consumers to know exactly where the product comes from.

Hand in hand with this, it also needs to encourage carbon footprint labelling of meat products. All research done to date suggests that, in terms of total carbon outputs, the industry is a world leader in sheepmeat and beef production. As an example our lamb producers are able to produce a given quantity of product

[76] It also means that potential threats to the industry can come from other industry sectors that are not clean and green. This suggests that industry leaders need to be in the forefront of calling for high environmental standards to be put in place across all industry sectors. If the country is going to talk the talk, it must also be prepared to walk the walk.

using only one quarter of the total energy required to produce the same amount in the United Kingdom. This is a quality we can sell – and if the right messages are put across in the marketing, will quickly bring a halt to those lobby groups that call for consumers to purchase local product because this is supposedly better for the planet. However, the later we leave selling this message, the more entrenched this view will be in the minds of consumers, and thus the harder (and more expensive) it will be to break these perceptions down. The industry starts from a very good position, particularly as regards energy used and total emission outputs from production. However, the biggest problem is that industry leaders have only thought about mitigating potential risks. They haven't yet made the leap to seeing the opportunities that abound for the industry to truly differentiate our products from all other competitors.

The industry's lack of genetically modified organisms (GMOs) in its supply chain is another key selling point. Again the key message the industry needs to get across to consumers is that the New Zealand sheep and beef sector is '100% pure'. While there is acceptance in many markets of GMOs in the food chain, use of such organisms by the industry would immediately compromise this message. Guarantees that our sheep and cattle are raised on non-GMO grasses are another way to differentiate our products from competitors.

The development of processing systems that can check qualities such as tenderness and juiciness in the manufacturing process (and prices that reward the best producers) are paramount. Together with on-going research in gene-mapping, this will allow the industry to isolate and identify those animal families that produce consistently high taste scores, allowing the use of these genetics across the industry. It also enhances our reputation for high quality.

This reputation for quality is the reason the industry should avoid 'own brands'. Supermarkets have begun the practice of putting their own brand on food products to indicate to consumers that they recommend these products. However, this prevents the industry from developing a relationship with consumers, and it is far more profitable to develop a relationship with them than

with a retailer. Consumers aren't just buying a rack of New Zealand lamb – they are doing their bit to save the world while at the same time enjoying a fantastic eating experience. This becomes impossible with someone else's brand on our product.

It also means the industry needs to supply retailers and the HRI trade with case-ready products – products that are already in their final packaging and do not require any further cutting or preparation of the product. Allowing another entity to be involved at this stage runs the risk that they may make a mistake for which the industry back in New Zealand will be blamed.

4.3.2. Strategies – Marketing Structures

Despite its size, the sheep and beef sector has limited resources. However, due to the fragmented nature of the exporting sector, we insist on diluting these resources even further in servicing our markets. One of the requirements of high value markets is the necessity for people on the ground in these markets, servicing clients, ensuring smooth distribution, preparing marketing campaigns, and so on. In such markets, it would be far effective to have one company with 15 people on the ground than 20 companies with 1 or 2 people. Not only do we make our limited resources go further by employing less people, but they should be far better at looking after the needs of the marketplace – 15 people can get far more done than 1 or 2.

It also allows quicker responses to potential problems. One of the issues around the food miles debate was the slow response of the industry, despite having good data available to show the fallacy of the argument. Potentially part of the reason for this was a simple lack of resources available to get the message out to the right people – in this case the general public. One team, composed of specialists in different areas, would allow far better co-ordination of effort, and should deliver far better results.

The industry would be far better off with a structure based on something like the dairy industry model – one large farmer-owned co-operative with 80-90% market share, then a number of smaller niche players, and producers who commit to one of these entities for a minimum of one year. Internally this would stop the overly aggressive competition for stock that occurs today, with all the attendant problems this brings, and would enable much better planning in the processing, exporting and marketing sectors of the industry.

Furthermore, such a model gives the large company global scale. This gives the company strength when negotiating with shipping companies, retailers, and HRI chains, instead of many small companies negotiating with few large companies as is the case now. Integration through the supply chain would be more optimal, but potentially the biggest advantages lie in marketing. As the 'free rider' problem would be virtually eliminated, such an entity could invest far more in R&D, both internally and in-market, and capture all of the benefits of doing so.

Such a company would not need to be concerned about other entities getting some of the benefits of marketing campaigns and product branding spends, or New Zealand rivals potentially harming promotional exercises by having separate New Zealand brand campaigns sending mixed messages to consumers. It allows a truly long-term view of marketing strategy to be taken, and should ensure far more of the potential margins available would be captured.

4.3.3. Strategies - Sustainability

First and foremost, the sheep and beef industry needs to break the perception that, in overseas markets, locally-produced products are better for the environment than those, like ours, that are imported into that country. The argument that such products have a smaller carbon footprint than imported products is a fallacy, yet the industry has been very slow to combat these consumer perceptions. We have been guilty of forgetting that perception is

reality – if consumers perceive that local products are better, then this must be true.

The sheep and beef sector has essentially buried its head in the sand around environmental issues. Industry leadership has taken a reactive approach, despite clear trends, both in New Zealand and in overseas markets, of the increasing importance of producers being able to demonstrate good environmental management. This is in contrast to the dairy industry, which clearly recognised the threats posed to industry sustainability by a lack of action, and developed an industry-wide strategy in 2005 designed to ensure its members are well-prepared for the future.

The sheep and beef industry needs to set clear targets, and timeframes to achieve these targets, in regards to sustainable land management. Although different regions of New Zealand face different challenges (and help account for the different approaches taken by regional policymakers), the principles of sustainable land management remain the same regardless of contour, soil type, or the use to which that land is put. These principles need to be clearly spelt out, and a plan developed that allows the industry to position itself as demonstrably the best land stewards in the world.

This paper has discussed the importance that both consumers and regulators are placing on environmental and climate change matters, and that presently industry leaders - as well as many individual farmers - view such matters as a threat (as well they might, given the potential ramifications to the industry if it continues to seek to avoid facing the issue head on). A failure to demonstrate good corporate citizenship at the farmer, processor, and exporter level will be extremely injurious to the industry in the years to 2025.

The Chinese ideograph for 'crisis' is composed of two characters: the first means 'danger', while the second means 'opportunity'. If the industry stops thinking about climate change and the environment as a danger, and instead see them as an opportunity, they will quickly see enormous potential benefits. Being the

world leader in 'green' production systems gives the industry the chance to truly differentiate our products from all global competitors.

To achieve this, at the producer level sheep and beef farmers will have to get used to spending more time detailing their on-farm practices. Those producers wishing to supply the best markets will need to keep comprehensive written records of such things as anthelmintic, antibiotic, and pesticide use, their types and with-holding periods. Nutrient budgets will be replaced by the more exhaustive nutrient management plans, which outline the method by which an individual farmer plans to manage their nutrient requirements.

At the heart of farm management by 2025 will be Land and Environment Plans (LEPs). LEPs comprise land, environment, and animal health plans that aim to both simplify on-farm decision-making and allow an individual farm to make the most optimal use of its resources. These need to be linked to internationally accredited environmental management systems such as ISO14001 that both consumers and retailers know and understand.[77]

New Zealand processors are by now well-used to audits of their operations by retailers or independently accredited bodies. The processing stage is the point at which consumer fears about food safety reach their zenith. The last few years have seen food scares around the world – bone fragments found in US beef exports to Korea, E.coli outbreaks in Europe and most recently in the US. Outside of animal disease issues such as bird flu and foot and mouth, the common denominator in these scares has been that they originated at the processing and packaging stage. Hence regular audits of processing facilities to ensure the safety and security of the systems they use is paramount.

Farmers need to prepare themselves for the same type of random audits of their operations and systems – hence the importance that will be placed on detailed records of on-farm practices. Such audits will be necessary to further convince

[77] Potentially the industry needs to go beyond the ISO14001 standard as this is based on processes and is not outcome oriented, thus it will not demonstrate actual improvements made on-farm. Also, results between entities can't be compared as individual results are kept confidential.

top-end consumers of the validity of our claims. Any industry is only as good as its reputation, and to access the highest value markets, ours must be blemish free.

Systems of this type in place on sheep and beef farms would have the added benefit of meeting requirements of local and national government regulators. However, while some farmers already have these systems on-farm, the majority are only moving slowly in this direction. To promote faster change, the industry needs to provide an incentive. Potentially the best method of doing so is to change the method by which farmers are paid for their stock.

Currently, farmers are paid according to what weight, muscling, and fat cover grades individual animals fall into – all of which are production variables. The grading system needs to change to recognise additional on-farm processes. Carbon neutral farms, as an example, could be paid more for their products – similarly, so could those properties that are part of internationally recognised EMS programmes. Changing the reward system in this manner (and giving farmers a timeframe after which the new system will be employed) sends the right pricing signals to farmers to adopt any changes they need to make on their farm to enable the industry to truly claim it produces the best red meat products in the world.

4.3.4. Strategies – Producers and Processors

Given the dysfunctional relationship between producers and the processors they largely own, farmers in New Zealand have long held the belief that competition between processors at the farm gate is a good thing for the industry, and for farmers individually. However, they fail to see that too much competition at the farm gate is the very issue that is the root cause of many of the industry's ills, and certainly will prevent the industry from achieving anything except a continuation of current problems if there is no change in the future.

Overly vigorous competition among processors hurts the industry in many ways. Highly competitive industries tend not to spend a great deal of money on research and development, as an example.[78] Processors concern themselves with security of raw material supplies and then worry about the marketplace later. Margins are too low to allow sufficient funds to be retained to enable the focus to shift from short-term tactical decision-making to long-term strategic decision-making. In short, the very thing that many farmers think is the best part of the industry is, in reality, the worst.

The aim of any company is to create wealth for its shareholders. It is not the job of a company to create wealth for its suppliers – quite the contrary in fact. The cheaper it can source raw material, potentially the higher its profits will be. Thus farmers that supply product to a company in which they have no interest are, in effect, transferring money from their own pocket into the hands of those that own the company. The major reason why farmer co-operatives were set up in the first place was so that farmers could capture more of the available returns.

Many farmers have forgotten this, and have hence come to see the co-operatives they own as simply another company out there trying to fleece them. Many have also forgotten that because they own these companies, as shareholders they have not just a stake, but a voice in the way co-ops operate. As such, it is in their power to force through whatever changes they think necessary.

However change can't happen until farmers accept that they lie at the heart of the industry's problems. The manner in which they have operated in the past has led to the fragmentation of not just the processing sector, but the exporting and marketing sector as well. Weekly competition for stock in this country not only adds costs, but makes any attempt to design long-term strategies fraught with risk.

[78] Baumol & Blinder, Economics – Principles and Policies, pg 711.

5. Conclusion

There will always be a market for the best – and consumers willing to pay what it takes to have the best. The New Zealand sheep and beef industry must strive to become the product that the world's affluent consumers choose above all others, not just because of the product itself, but for what that product represents.

The sector faces varied internal and external threats, but the central premise of this paper has been that, with the right leadership and vision, these threats can be turned into opportunities that will ensure the on-going success of the sector. Strategies designed to assure consumers of good environmental stewardship will also alleviate regional council concerns. A carbon neutral industry is not only arguably the key factor that will attract the world's affluent consumers, but also meets the government's emissions goals. Declining total production allows, in conjunction with the above, the industry to turn scarcity of product into an asset.

However, none of this will be possible without buy-in from farmers, and a willingness to change their own individual behaviour for the good of the sector. Farmers simply must work together outside the farm gate if the industry is to remain viable into the future. This suggests changing the mindset that it is farmers versus processors into the New Zealand sheep and beef industry versus the world. The dairy industry has demonstrated the value in farmers pooling their resources, to the point where their sheep and beef neighbours now look enviously over the boundary fence. And while this paper has attempted to outline potential strategies that might be employed by the industry, at the end of the day it is farmers, and only farmers, that can drive change.

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Appendix I: Externalities* and Economic Policy

In recent years, both national and regional government in New Zealand has begun creating certain policies that attempt to account for those costs from sheep and beef farms (and other industry sectors) that are borne not by the individual farmer, but rather by the general public. In economic terms, such additional costs, those that arise from the production or use of some good but are not paid for by the individual concerned, are called *negative externalities*. As such, government is attempting to find the true cost of the products concerned.

Pricing externalities is a difficult business, made more so by the fact that by far the largest proportion of our sheepmeat and beef is sent overseas, and thus government does not have the luxury of assuming these goods are all consumed by the economy in which they were produced. Furthermore, when looking at externalities, in order to derive a true price for a product it is as necessary to examine the *positive benefits* to society as it is to look at the negatives (and when examining climate change policies, this necessarily means taking a global picture). At the current point in time, from the type of policies that are being proposed, it would appear our policymakers are not considering any positive externalities, and when the potential ramifications of such policies include changing the shape of the entire New Zealand economy, this seems short-sighted in the extreme.

A.1: Externalities

The real cost of a good is defined as the private cost to the producer, plus the incidental costs of producing that good borne by others. Harmful externalities increase the real cost of a good, while beneficial externalities reduce the cost of the good. Economic theory concerns itself with costs associated with the next

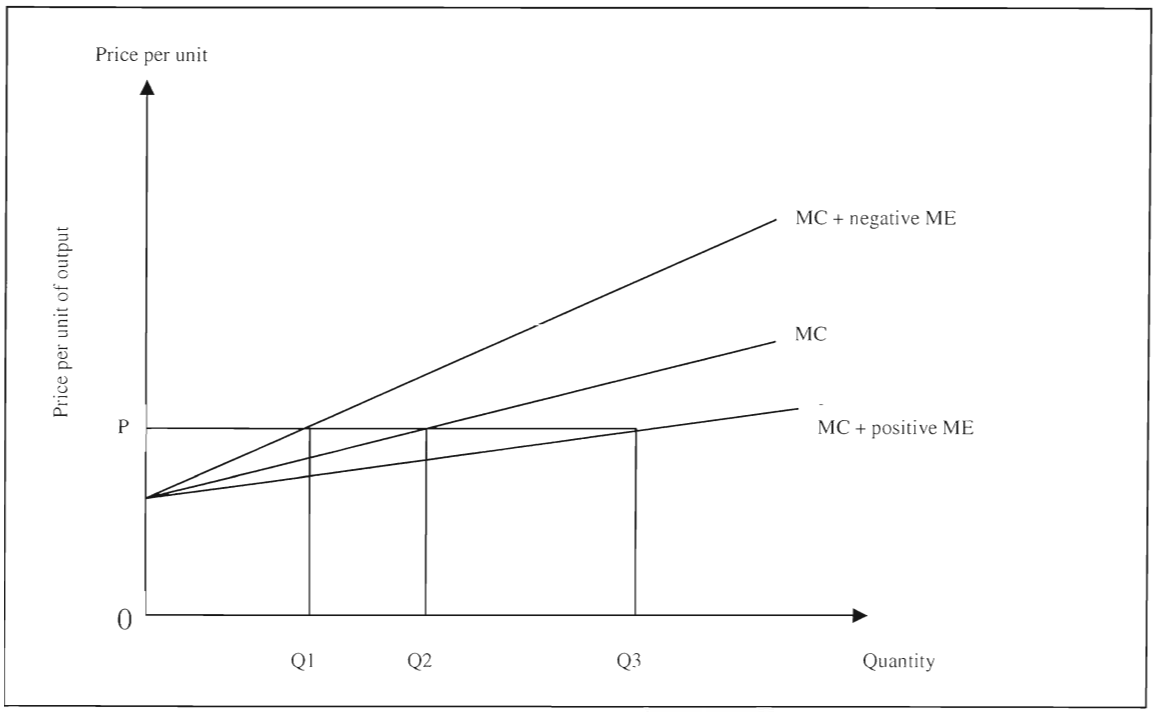
* Please note that definitions in this appendix have been sourced from:
- Robert Scollay & Susan St John, Macroeconomics and the Contemporary New Zealand Economy, 1996
- Jack Hirshleifer, Price Theory and Applications, 4th Ed., 1988
- William J. Baumol & Alan S. Blinder, Economics – Principles and Policies, 4th Ed., 1988

unit of the good that is produced, hence the term *marginal costs* (MC) and *marginal externalities (*ME). Businesses continue making a profit so long as the marginal cost of the good is less than or equal to the price of that good. When the price exactly equals MC, this will show the profit-maximising output of the good. Therefore:

true marginal cost = marginal private cost +/- marginal externality

Economists are concerned with the efficient use of resources. Externalities, whether these are positive or negative, ensure an inefficient use of resources in the short run if these externalities remain un-priced. If a firm causes a negative externality, it will produce more goods than it should, if it produces a positive externality, it will produce less goods than it should. This is pictured in the diagram below.

Fig. 1: Pricing Harmful and Beneficial Externalities



A firm that maximises its profits (but one in which any externalities remain un-priced) will continue producing until its marginal costs are equal to the price it receives for this extra unit. In this case, when the price is P, the firm will produce Q2 units of the good. However, if the firm is also producing a negative externality, and this externality is included in the costs of production, a firm's output will reduce to point Q1, this being where the new marginal cost (including the negative marginal externality) of the firm equals price. Similarly, if a firm produces beneficial externalities, and these are included in costs of production, then a firm will expand its production to point Q3.

The diagram above looks at what happens to production when the price of the good remains fixed. However, similar things happen to output when you allow the price to move. Imagine that a firm producing a negative externality is taxed on every unit of output. In order to try and recover this tax, the firm decides to increase the price it charges. However, as price rises, demand for a good falls, leading to less output from this firm. If the firm produces a positive externality and is given a subsidy, the firm can afford to drop its price and therefore increase the demand and supply of its product.

The difficulty with externalities comes when it is time to actually price them. As an example, potentially we should be charging a car company for producing a good that causes air pollution. However, what is the cost of one additional car on the road to all New Zealanders (i.e. what is the marginal externality) in terms of additional public health spending? Shouldn't we also consider the benefit to society of being able to move more quickly from one place to another than if we were on foot? And what happens when a car company produces a car that puts cleaner air out its exhaust than it sucked into the engine? How much does the public gain then?

The usual method of dealing with an externality is through the use of transfer payments to and from the maker of that externality. If the externality is harmful, transfer payments flow from the maker (usually in some form of tax). If the

externality is beneficial, transfer payments flow to the maker (usually in the form of a subsidy).

To give the most accurate picture, and to ensure the most efficient outcome, all the costs and the benefits of an activity need to be brought in to the equation. Should you only consider one side of this equation, then this will necessarily lead to an inefficient use of resources – if you explicitly price the costs of an activity but do not price the benefits, this will inevitably cause a decline in that activity that may not be justified when the whole picture is taken into consideration. The trouble is that in many cases, the costs and benefits will be widely diffused among society as a whole, and the value that society places on these costs and benefits will vary from person to person within society.

Externalities are largely to do with the net benefit or cost to the wider society in which that good is produced or used. As such, in many cases externalities occur to public goods – those commodities or services that everybody uses (or is able to use), and from which it is virtually impossible to prevent people from realising the benefits or negatives from using it, even if they don't want to pay for the good. Air is a classic example of a public good, New Zealand's environment is another – you cannot stop people from breathing, nor can you prevent them from living in, and using, our environment.

At the heart of the debate is the issue of "free riders". In a traditional economic sense a free rider is someone that benefits from an activity, but does not pay for that activity. However, by the same token that same person may be disadvantaged by an activity, but not recompensed. To overcome this problem, the value of the incidental costs and benefits should be included in the price of a good.

A.2: Externalities, the Environment, and Local Government Regulation

In New Zealand, we have just begun the process of trying to price negative externalities caused by the pastoral sector on the environment. This began with voluntary efforts on the part of individuals to reduce their impact on the environment. In effect, these individuals were subsidising wider society by attempting to improve the environment (from which everyone derives the benefits), through such mechanisms as fencing off bush remnants to improve biodiversity, or fencing off waterways to prevent surface runoff from entering streams. Lately, pricing negative environmental externalities has taken the form of regulation by regional and national government.

However, it is one thing to voluntarily undertake an activity that will benefit society as a whole. It is another thing altogether when coercive measures are used to achieve the same result. As soon as you implictly begin to price the negative environmental impacts of an activity, you must also begin to price the positive environmental impacts of that activity.

Agriculture in New Zealand has many beneficial impacts from which others benefit. As noted above, creating and managing bush remnants has a value. Similarly, maintaining soils that provide water filtering and water retention functions, and act as carbon sinks are all positive aspects of pastoral farming from which wider society benefits.[79] Simply maintaining New Zealand's landscape, renowned throughout the world, provides benefits over and above that enjoyed by farmers. "Landscapes encompass amenity, cultural, and recreational values… and in so far as the farmed landscape is valued by society, the activities that maintain it generate a positive environmental externality."[80] What, for instance, is the value to the New Zealand tourism industry of the farming vistas every tourist sees? What is the value to the New Zealand public of the exceptional air quality they enjoy, in large part due to our extensive pastoral sector?

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[79] Manhire & Emanuelsson, op. cit., pg 25
[80] Ibid., pg 31

Other developed countries have recognised that just as farming may have harmful effects on wider society, it also has positive impacts, and have begun rewarding farmers for these benefits. Yet the danger is that policymakers in new Zealand will fail to factor in these benefits and concentrate only on the harms, potentially sending the wrong messages to farmers, leading to poor decision-making and inefficient resource use.

Another problem is that at the national level we have not set national policy standards for items such as water quality, and in only a few specific areas, such as Lake Taupo and the Rotorua Lakes, have regional councils defined levels of an output that is acceptable or unacceptable. Even here, regional councils have again not priced in the positive benefits that derive from the actions of an individual. Yet potentially we are asking one sector of the economy to bear costs from which all sectors derive benefits.

Farmers in the Lake Taupo catchment, for example, have been asked to reduce nitrogen outputs from their farms by a set amount over a period of time. By doing so, water quality in the lake is set to improve so that the wider New Zealand public can benefit. However, at the present point in time, it appears farmers will have to reduce production, and hence income, but will not be recompensed for the increase in societal value.

The one advantage regional councils have when setting policy is that they are dealing with what is essentially a closed economy – one in which there are no imports and exports. The national government does not have this luxury, yet have introduced a climate change policy in agriculture whose design seems to implicitly assume that New Zealand is a closed economy, and whose net outcome may in fact be to increase the total amount of global agricultural emissions, the exact opposite of what is intended.

A.3: Climate Change Policy

As part of the government's strategy to combat climate change, the government will in 2013 introduce an Emissions Trading Scheme (ETS) that will cover all greenhouse gases in agriculture. The ETS will be a cap and trade scheme, in that emissions will be capped at 2005 levels, credits worth 90% of total emissions will be given to the sector, and from this point on the credits will be freely tradeable both within the sector and with outside industries. Every year the sector will have to reduce or off-set its total emissions until 2025 when it will be fully responsible for the costs of any net emissions.

This paper has already discussed the potential ramifications of the scheme to individual farmers and the sector (Section 1.3). In the main this amounts to either enormously increased on-farm costs, or a decline in total production, or both. It made the point that this policy assumes that, like other sectors, agriculture will be able to pass on the costs of the scheme to consumers.

However our agricultural industries do not operate in a closed economy. The vast majority of produce coming off New Zealand farms is exported – in the case of the sheep and beef sector, around 85% of all goods produced end up in overseas markets. Thus the assumption is that exporters will be able to increase the price of our products overseas, and pass these increases back to farmers.

All other things being equal, for this to happen other countries need to be operating similar schemes, with similar timetables, in their agricultural sectors – so costs of production increase in all countries equal to their total emissions. However, none of our major trading partners are in the process of implementing similar schemes in their pastoral sectors.

The goal of all emissions schemes is to encourage a more efficient allocation of resources that results in lower global emissions. Given a similar scenario to New Zealand's ETS, high polluting entities within a sector will be relatively

disadvantaged, and will either invest in cleaner technologies that reduce their emissions, make transfer payments to other entities that are more efficient, or cut production. In other words, the aim of such schemes is to ensure that those companies with high negative externalities end up having much higher costs of production than those companies with low negative externalities, so these entities are forced to change their behaviour.

Table 1 : Total energy and carbon dioxide indicators for NZ and UK lamb production

Item	Quantity/ hectare		Energy MJ/Tonne carcass		CO_2 Emissions kg CO_2/Tonne carcass	
	NZ	UK	NZ	UK	NZ	UK
Direct						
Fuel, Electricity and Oil (L of Diesel Equiv.)		128		17,156		1,116.9
Fuel use (L of Diesel) (including contracting)	15.5		3,565		244.9	
Electricity use (kWh)	13.8		594		11.4	
Direct sub total	**-**	**-**	**4,158**	**17,156**	**256.3**	**1,116.9**
Indirect						
Nitrogen (kg)	5.7	76	1,953	16,147	90.1	807.4
Phosphorus (kg)	12.5	7	985	336	59.1	20.2
Potassium (kg)	0.5	15	29	498	1.7	29.9
Sulphur (kg)	12.3		323		19.4	
Lime (kg)	22.3	87	71	170	50.6	122.7
Agri-chemicals (L ai)	0.6	1.5	338	1,549	20.3	92.9
Concentrate (kg of dry matter)		681		7,432		457.5
Forage, fodder and bedding (kg grass silage)		271		1,319		76.5
Indirect sub total	**-**	**-**	**3,698**	**27,452**	**241.3**	**1,607.1**
Capital						
Vehicles and machinery (kg)	0.8		273		25.4	
Farm buildings (m^2)	0.1	13.1	198	1,251	19.8	125.1
Fences (m)	1.9		194		17.5	
Stock water supply	-		66		3.0	
Capital sub total	**-**	**-**	**731**	**1,251**	**65.6**	**125.1**
Total Production	**-**	**-**	**8,588**	**45,859**	**563.2**	**2,849.1**
Yield (kg lamb carcass)	**190**	**308**				
Post Production						
Shipping NZ to UK (17,840 km)	-	-	2,030	-	124.9	-
Total Production Energy Input/Emissions	**-**	**-**	**10,618**	**45,859**	**688.0**	**2,849.1**

Source: Saunders, Barber, & Taylor

Recent studies would suggest that New Zealand lamb producers are 4 times more efficient than their British counterparts in terms of total emissions expended to produce an equal amount of product. As Table 1 shows, in terms of total production emissions, the New Zealand sheep industry emits 688 kilograms of CO_2 to produce 1 tonne of lamb (including energy costs associated with shipping the product to the UK), whereas the United Kingdom sheep industry emits 2849 kilograms of CO_2 to produce the same amount.[81] If the world is to reduce total emissions, it therefore stands to reason that additional production should be encouraged in New Zealand, and less production in the UK, so long as New Zealand can maintain this competitive advantage. This way net production remains the same, but total global emissions fall.

However, all other things being equal, the net effect of the New Zealand government's ETS policy will most likely be declining production of lamb from this country, with this slack taken up by producers from other countries, including the UK. Thus net global emissions will, in all likelihood, actually increase – the exact opposite of the result intended by government.

From a global emissions perspective, in order to be truly effective any economic policy aimed at reducing emissions in a specific sector needs to be mirrored by similar policies in that sector in other countries - which suggests a far higher degree of economic policy co-ordination across countries than happens now. The proviso to this rule are those sectors that essentially operate in a closed economy, in which case policy co-ordination would be un-necessary as the net effect should be the same regardless of policy (and assuming these policies are designed to encourage a drop in total emissions from each sector).

A failure to have co-ordinated sector emissions policies across countries in an open-economy model risks The Law of Unintended Consequences. In the case of the government's ETS scheme as it applies to agriculture, global emissions from the sheep and beef sectors are likely to rise. At the same time, *ceteris paribus*, the

[81] Caroline Saunders, Andrew Barber, & Greg Taylor, Food Miles – Comparative Energy/Emissions Performance of New Zealand's Agriculture Industry

sheep and beef sector in New Zealand will bear a heavy cost, with unknown economic consequences for the rest of New Zealand.

A.4: Kyoto vs. Carbon Neutrality – A Sheep and Beef Perspective

When New Zealand signed up to the Kyoto Protocol, the expectation was that this country would have to reduce its total emissions to 1990 levels, and that policies would be introduced to encourage industries to reduce total emissions and thus allow the country to meet its commitments. However, with the announcement of its climate change policies, the present government has gone very much further than that required by Kyoto. The ETS aims for New Zealand to be carbon neutral by 2025.

The aim of carbon neutrality is far in advance of most other countries in the world. Whether we succeed in this aim and maintain something like our current economy and standard of living is predicated on investment in research and development being able to come up with innovative solutions that will enable various sectors of the economy to drastically reduce their emissions while maintaining production.

Nowhere is this more true than in the sheep and beef sector. Of the two main emissions from this sector, some potential exists to lower NO_2 emissions through the use of newly-developed nitrification inhibitors. However, results from using these products vary widely from region to region, and their net impact is likely to be minimal, when used as part of a normal fertiliser program, in the greater context of emissions from the sector (nitrogen fertilisers do not play a large part in the average sheep and beef farm's fertiliser spend). Methane emissions from livestock are another matter entirely, with no mitigating technologies currently on the horizon, despite millions having been spent by government and industry to try and find a solution. Thus the government has gambled the future health and wellbeing of the sheep and beef sector (and dairy for that matter), on nothing more than the promise of a potential cure for livestock emissions.

From a sheep and beef industry perspective, the change from needing to meet Kyoto commitments to having to chase full carbon neutrality is an economic body-blow. The sector would be perhaps the only major industry that, if we were still aiming just at Kyoto, would be heavily in credit. The reason is simple – the industry is currently producing about the same amount of product that it did in 1990, but utilising significantly less stock to do so. Sheep numbers in New Zealand have declined by a massive 32% since 1990, while beef numbers are down by 4%.[82]

Hence should the country's target be Kyoto, the industry would be in a position whereby it could expect to have significant carbon credits to sell on the open market. Depending on how many tonnes of carbon equivalents you assume are emitted from a hectare of sheep and beef land per year (and assuming a price of $15 per tonne of carbon), the sector would be in credit to the tune of between $180-250 million. However, if the goal is full neutrality, this leaves the industry significantly worse off, with the full costs in 2025 being between $250-500 million.[83] Obviously from an industry perspective, the government's move away from meeting its Kyoto commitments and towards full carbon neutrality carries a heavy potential cost for the sheep and beef sector. It is thus somewhat surprising that the industry has been so quiet on the issue.

A.5: Private Cost vs Public Benefit

Agriculture makes up less than 7% of the population, contributes around 20% to GDP every year,[84] and is being asked to cover nearly 50% of New Zealand's total greenhouse gas emissions. The argument used for justifying this is generally around the principle of "the polluter pays". The agricultural sector is producing a negative externality, and this externality should be priced and included in the sector's costs of production. However, as this paper has discussed, if you price

[82] Meat & Wool New Zealand Economic Service
[83] Also assumes that all farmers do not change their farming practises or offset emissions in any other way
[84] This figure understates the contribution of agriculture to the New Zealand economy, as it narrowly looks at agriculture and its associated processing and service industries and does not consider any multiplier effect.

negative externalities, you must also price positive externalities. Yes, agricultural production does produce significant greenhouse gases, but if you charge the sector for this, you must also reward them for the benefits they bring.

In essence, both national and regional government are asking parts of the private sector to pay all the costs of what are public goods. The greatest problem with this is that those parts of the private sector that have to bear this cost are not able to capture all of the benefits from doing so. Wider society thus becomes the free rider. Is this fair and equitable for all concerned?

This paper is not suggesting for an instant that we should not be doing all we can to combat environmental or climate change degradation. What it is suggesting is that policymakers are imposing laws whose implications, both for the industries involved and wider society as a whole, have not been carefully enough thought through. The conundrum for policymakers, particularly those in the climate change arena, is that the people they must try and target are not industries or sectors, but individual consumers within global society. At the end of the day, it is their consumption decisions that determine the success or failure of policy. The question is, have New Zealand policymakers designed policies that will cause producers and, more importantly, consumers to react in a manner that will achieve the outcomes that they expect at a global level?