Sheep Updates 2005 - Part 1

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Despite Western Australia’s world class research effort on ways of improving the reproductive performance of Merino sheep over the past 35 years, analysis of the performance of the State flock shows that there has been only modest improvement in the number of lambs marked per 100 ewes joined, and much of it was achieved in the 1980s (see Figure).

In the early 1990s, Kelly and Marshall (1) estimated that in the previous 7 year period there were about 10 more lambs marked per 100 ewes joined (and 0.6 kg more greasy wool produced per adult sheep) than the then long term average of 68%. Today the average State lambing performance still lies below 80% – suggesting that we have reached a plateau. Yet at the same time, the New Zealand sheep industry has achieved spectacular improvements in its lambing performance – by around 30% since 1990 (see paper by A Bray, this section).

Why is this so – have we reached a biological limit for the Merino sheep, have there been other changes that make the status quo a laudable outcome, or has the application of the research been inadequate? We grow enough feed to produce 1 tonne of meat and 100 kilograms of clean wool per hectare on our best land in WA, so the productive limit of our land has not been reached. Has a focus on increasing wool cut per head compromised reproductive performance, as suggested by N Adams (pers. comm.). Economic incentives have now appeared - the value of lambs has increased markedly since early 2002, from around 170 c/kg carcass weight to often over 300 c/kg. At the same time, whole farm analyses suggest that the value of extra lambs has also changed, so that producing an extra lamb is now worth up to $23 to a wool producer and up to $49 to a prime lamb producer (J Young, pers. comm.). Are the economic drivers now in place to encourage higher lambing percentages?

Clearly farming must continue to adapt, as the next decade will be different to the last. We can already see Australian’s demands for food and fibre changing as they expect to live longer and healthier lives, increasingly adopting preventative strategies such as changing diets. Meanwhile, growth in individual wealth in Asian countries is leading to a change to more western-type diets. The quantity and quality of the meat and wool produce from our sheep will change with these market changes, providing new opportunities. We hope that this series of papers will stimulate thought about strategies to boost lamb production to provide ways to capture these opportunities.
REFERENCES

Kiwis can fly - 30% higher lambing in 15 years
A R Bray, Meat & Wool New Zealand, Wellington, New Zealand

Abstract

New Zealand's average lambing percentage has increased from 100% in the 1980s to 130% today. There is no doubt that genetic improvements increased the potential in many flocks and overall animal health care has improved, but the single biggest contributor to the increase appears to have been better feeding. Improved feeding year-round is likely to be responsible rather than feeding at any particular time.

Introduction

Since the 1980s, shifts in world prices and future market prospects for lamb meat and carpet wools have fuelled changes in farm practices to increase lamb production with less attention being given to wool on many New Zealand farms. Clear messages from meat companies without the distortions previously created by government subsidies, have encouraged many farmers to direct their investment and management effort to lamb production. The decline in wool returns and perceived poor performance by, and prospects for the wool industry made the decisions easier. Total production of lamb meat is the same today as in the 1980's, despite sheep numbers falling from 70 to 40 million. This is a consequence of the national average lambing percentages (lambs docked / ewes mated) steadily increasing from 100 to 130% and lamb carcass weights increasing from 13.2 to 17.2 kg. These improvements are all the more notable because they occurred while farm labour inputs declined. They also occurred without a concerted research and extension programme. That is, they were driven by farmers responding to favourable commercial and political environments.

How has the lambing percentage increase in particular been achieved?

Review

Feeding

The simultaneous improvement of ewe and lamb carcass weights and lambing percentages point to farm-wide improvement of nutrition since the 1980's. This is not a result of a national reduction in stocking rate or an increase in new pastures. The area in feed crops and area harvested for hay or silage have increased but their combined contribution is only 5% of average farm area, limiting their impact on lambing percentage. The extra feed required for the improved performance is more likely to be the result of greater use of fertiliser. Fertiliser application per stock unit in the early 2000s was
near twice as high as in the late 1980’s and early 1990’s. Another source of better nutrition could be better pasture quality or higher pasture utilisation as a result of improved grazing management but there is no quantitative measure of this.

**Pregnancy scanning**

Scanning (now used in 60% of flocks) allows flocks to be divided into mobs of barren, single, twin and triplet bearing ewes for sale or differential feeding and lambing management. It has stimulated farmer interest in the potential number of lambs, and has enabled limited feed, shelter and labour resources to be targeted at the highest risk groups. It is credited with a substantial role in bringing about changes in attitudes and practices.

**Animal Health**

The efficacy of animal health treatments has improved and the use of some (e.g vaccines against abortion diseases) has increased, but once again there is no quantitative measure of their contributions to the better performances.

**Genetics**

A significant source of the gain in lambing percentages will have been the breeding of higher fecundity sheep. Selection within breeds for fecundity using breeding values derived from objective measurements, large scale breeding schemes, and cross-breeding have been widespread. Composite “breeds” are increasing in popularity, combining Finn and East Friesian (for fecundity), Texel and Poll Dorset (for meat characteristics) with Romneys and Coopworth genes. A host of new brands like Tefrom, Lamb Supreme, Kelso Ranger, and Highlander have appeared.

**Hogget mating**

30% of ewes lamb as hoggets, a doubling of the figure for the 1980s. They now produce 5% of all lambs.

**What aspects of reproduction have changed?**

My belief is that ovulation rates will have increased due to improved nutrition and genetics, and foetal losses due to abortion have been reduced by vaccination. Better nutrition and overall care are expected to have reduced embryonic mortality, foetal losses due to ewe deaths, and lamb losses at birth. The gains will have been offset to some extent because there are now greater numbers of ewes and lambs in the higher risk twin and triplet categories.

**Future**

The lambing percentage figures show no indication of plateauing (see graph above), and the performance of the best flocks show there is plenty of potential for further improvement in most flocks (graph below). Therefore, as long as lamb prices and prospects are as favourable as they have been in recent years I am optimistic that lambing percentages will continue to increase as farmers continue to address the factors limiting lambing percentage and make the management changes needed to meet the greater demands of a more productive flock.

Distribution of lambing % for NZ flocks in 2002-2003 when the national average was 125% compared to that in 1990-01 when the average was 103%
How do Merino sheep perform in New Zealand?

Merino sheep are 8% of the national flock. Historically most came from Australia and some rams and semen are still obtained from eastern Australian flocks but over the last century the vast majority of sires have been locally bred. Most Merinos are found on 240 South Island high country farms where they experience our harshest and most variable farming environment. They graze a mix of improved and native pasture with a short growing season in spring, a dry summer, and a 4-5 month winter during which cold temperatures mean there is little pasture growth. For much of the year sheep on extensive hill pastures the pasture is medium to poor quality. Sheep performances are lower than on other classes of New Zealand farms and have been static in recent times. In 2003-04 wool production was 4.7 kg per stock unit and lambing percentage averaged 84%. Wool provided 59% of farm income, sheep sales 31% and cattle sales 8%. Environmental constraints and a continuing wool focus are likely explanations why ewe reproductive rates and lamb growth rates are lower relative to other farm classes and have not increased in recent years.

In one group of Merino flocks monitored in the mid-1990s, the average mating weight of mixed age ewes was 48 kg. The average number of foetuses at pregnancy scanning was 115% and lambs at docking 84%. In another group of flocks from a wide range of breeds and farm types, the scanning % in Merino flocks was 13% below the all-breed average after adjustment for difference in mating weight. When compared at the same scanning %, the losses from scanning to docking were 6 % greater In Merino flocks than the average. These poorer performances by Merinos are likely due at least in part to the tougher environments in which Merinos are farmed and less intensive management. The rate at which reproductive performance increased with liveweight was similar for all breeds. That is, the potential for better feeding to improve Merino reproduction rates was as great as in other breeds.

Conclusion

Why has the response in New Zealand been much larger than other places like Western Australia? The world lamb meat prices are the same. There must have been unrealised potential in New Zealand and an infrastructure that could respond to the opportunity. Most importantly it required farm business men and women who were motivated and had the confidence to grasp the opportunity. The large size of the change we have seen shows that it was not just a few of them. It takes the contribution of a hefty majority of 15000 farms to raise the national average by 30% in 15 years. To my mind that gain has come from applying existing knowledge about feeding and breeding with improved year-round feeding being the single most important factor.

Keywords

New Zealand, lambing percentage, feeding, breeding

Acknowledgements

To the Meat & Wool New Zealand Economic Service which collected the data on which this paper is based, and the entrepreneurial farmers who have responded to market signals and harvested the benefits.

Paper reviewed by: Rob Kelly
Rams are not a trivial expense, so what can you do to maximise on your investment?

Chris Oldham, Sheep Industries and Pastures (DAWA)
Graeme Martin, and School of Animal Biology (UWA)

ABSTRACT

The reproductive potential of rams is an important contributor to the value of the rams and their contribution to future sheep income. The variation between ram sources is being documented as the results of ewe productivity trials are published. The estimated breeding value for individual sires is available to breeders on the website of Merino Genetic Services. Having taken control of genetics, the producer must then look after the environmental factors that affect ram fertility, particularly nutrition. Rams in condition score 3.5 - 4.0 have maximum testicular size and therefore maximum capacity to produce and deliver sperm, so it is logical to feed rams to be in that condition at the beginning of mating. There is, however, a delay of 7 weeks between the beginning of liveweight and testicular growth and increased sperm output, so it is important to begin preparing rams at least 8 weeks before mating. Similarly, because mating lasts only 5 weeks, and it takes 8 weeks for a ram to produce new sperm, it is vital that nothing happens to the ram flock that might harm the sperm stored in the epididymis in the 8 weeks leading up to mating. Stresses during this period can reduce sperm viability. Finally, the ram percentage may need some rethinking. The minimum recommendation is, for mature experienced rams, 1.5 rams per 100 ewes and double that proportion for young or inexperienced rams.

INTRODUCTION

In Western Australia, the cost of rams contributes about $13 to the cost of each lamb tailed in the first year the ram is used. This estimate is based on flock rams valued at $500, joining at 2%, and the long-term average of 75 lambs tailed per 100 ewes joined (www.agsurf.abareconomics.com.au). Clearly, rams are used for more than one year so the marginal cost can be reduced but this needs to be balanced against the potential genetic gains of continually improving the breeding value of sires. It is also clear that it is important to choose replacement rams using the very best information available and then manage those animals so you maximise their input into your flock. This paper reviews the physiological, environmental and genetic factors that must be considered when managing rams to ‘industry best practice’.

REVIEW

Genetic merit

Choice of Merino rams has an obvious impact on the quantity and quality of the wool produced by their progeny and rams are increasing valued and sold on their Australian Standard Breeding Value (ASBV) for these traits. However, their potential to affect the reproductive performance of their female progeny is mostly overlooked. The range in ASBVs for number of lambs weaned varies by more than 65% between Merino sires (1). This point is strongly reinforced by the finding that there was a 55% range in the percentage of lambs weaned per daughter mated (50 to 105) between sires in the South Australian Merino Central Test Evaluation (2). Superiority was positively correlated with the live weight of the daughters at mating but, most importantly, it was made up of incremental increases in proportion of ewes conceiving, proportion carrying twins and the survival to weaning of fetuses scanned around Day 90 of pregnancy. The effects of superior reproductive potential on economic returns from Merino flocks was also very clearly demonstrated in the ewe productivity trial reported at last years Sheep Updates: the most profitable flock (>250 per ewe) earned the least wool income but was vastly superior in lambs weaned (3). Merino Genetics Services report sire ASBVs for lambs born and weaned as well as testicular circumference (http:mla.com.au/mgs), so the choice is there for ram breeders to exploit these important sources of variation. Similarly, commercial sheep producers can equally choose to look closely at the results of ewe productivity trials as they are published and change or put pressure on their ram supplier(s).
Nutrition

Once you have chosen the right ram or ram source what more can you do to increase the impact of your purchases? The size of the testes of rams is directly proportional to their capacity to produce sperm (4). Rams in condition score 3.5-4.0 (fit and with plenty of energy stored on their backs) will have maximum testicular size and sperm reserves at the start of mating. In addition, hard-working rams will lose live weight and testicular mass steadily as the mating period progresses, independently of the body or testicular mass they started with (5). For these reasons, it is a logical strategy to feed rams that are in low condition so they reach 3.5-4.0. However, while testicular size begins to respond within a couple of weeks after an increase in nutrition, sperm output per ejaculate does not begin to increase for about 7 weeks (6). It is therefore vital to start feeding the rams from at least 8 weeks before mating.

General health and enthusiasm for the job at hand

Current ‘best practice’ is to mate for only about 5 weeks but it takes 7-8 weeks for a ram to produce new sperm so they need to be looked after throughout the 2 months leading up to mating. It is vital that rams are fit and healthy (feet, testes, epididymis) before feeding begins and that nothing undesirable happens to the ram flock that might harm the sperm stored in the epididymis during that period. Stresses such as shearing, crutching, fly strike, vaccination or drenching may reduce sperm viability.

How many rams?

The ram percentage may need some rethinking as new options for managing the lambing flock are considered. The conception rate in a flock of ewes decreases when mating loads per ram exceed 6 ewes per day (7). Hence, the minimum recommendation, for mature experienced rams, is 1.5 rams per 100 ewes (8). However, because not all rams work and young or inexperienced rams are less efficient than older rams, it is advised to use at least 4 rams per flock (independent of the number of ewes) and at least double the proportion of young or inexperienced rams. Moreover, if a short lambing period is planned, or if the ewe flock is being teased, then as much as 4% rams may be needed.

CONCLUSION

The genetic merit of rams for reproductive potential is important to farm profits and information is available to help producers choose the best ram sources and the best individual sires. Considering the value of this investment, it is logical and economic to feed rams to attain their maximum possible capacity for sperm production before mating begins, and to ensure that they do undergo any stresses in the 2-month period leading up to mating.

KEY WORDS

Rams, reproductive potential, mating, nutrition

Paper reviewed by: Keith Croker and Rob Kelly

REFERENCES


Care for mum - fetal programming, lamb survival and lifetime performance

R W Kelly  CSIRO Livestock Industries, Floreat WA 6014

ABSTRACT
There are four critical outcomes from the nutritional manipulation of the pregnant ewe – how it prepares her for lambing and nurturing her lambs, the performance of the lambs when they are born, the performance of the surviving lambs throughout their lifetime, and her productivity in terms of wool production and recovery of live weight to the next joining. This paper shows the importance of good nutrition throughout pregnancy on the performance of lambs.

INTRODUCTION
About one in every five or six lambs born each year in Western Australia dies at or about the time of birth. Nutrition of the breeding flock has important effects on birth weight and lamb survival. In recent years, the importance of fetal development as a determinant of lifetime performance has also become evident. We now understand that sub optimal nutrition of the pregnant and lactating ewe can reduce her progeny’s skeletal growth, mature body size, carcass composition, lifetime reproductive capacity and quality and quantity of wool production. In human studies, associations have been found between undernutrition during pregnancy and birth weight, the incidences of coronary heart disease, stroke, hypertension and non-insulin dependent diabetes, and there is evidence of a carryover effect of birth weight into the second generation. Farmers often report that lambs born in drought conditions remain as poor performers throughout their lifetime. This paper focuses on the impact that the nutrition of the breeding ewe during pregnancy and early lactation has on lamb survival and lifetime production.

REVIEW
Lamb survival

Over the past three decades in Western Australia, considerable research effort has been directed at improving the lambing performances of Merino sheep flocks. One method tried in the 1970s involved crossbreeding with the high fecundity Booroola Merino sheep. These flocks, with high numbers of twin and triplet bearing ewes, suffered high levels of lamb mortality. To boost lamb survival, initial efforts concentrated on providing good nutrition in late pregnancy, but unfortunately such approaches were spectacularly unsuccessful (Table below).

<table>
<thead>
<tr>
<th>Feeding treatment (g/hd/day)</th>
<th>Hay + 350 oats</th>
<th>Hay + 700 oats</th>
<th>Hay + 500 lupins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth weight (kg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>singles</td>
<td>4.4</td>
<td>4.5</td>
<td>4.4</td>
</tr>
<tr>
<td>twins</td>
<td>3.2</td>
<td>3.3</td>
<td>3.4</td>
</tr>
<tr>
<td>Mortality (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>singles</td>
<td>11</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>twins</td>
<td>38</td>
<td>35</td>
<td>34</td>
</tr>
</tbody>
</table>

One solution to this conundrum appeared when research showed that the weight of the ewe in mid pregnancy was also related to lamb birth weight, coupled with the understanding that placental size and lamb birth weight are highly correlated, and that maximum placental weight is reached about day 80 of pregnancy. Nutrition of the ewe during early and mid pregnancy was clearly important, and the findings were backed by studies on 18 commercial sheep flocks showing high correlations between on-farm lamb mortality and live weight of the ewes in mid pregnancy (see Figure). This has been supported by recently published work in South Australia (1).
Low birth weight lambs also have impaired development of the central nervous system, which may affect vigour at birth. The fact that under feeding in mid pregnancy cannot be overcome by a return to adequate feeding in late pregnancy, coupled with the lower energy reserves in the low birth weight lambs, higher mortalities with no post mortem evidence of suckling, and the challenge to keep a “hungry ewe” on the birth site, provides compelling evidence of the need to look after the breeding flock at all times to ensure good lamb survival.

**Lifetime performance**

Recent work has focused on the lifetime performance of the progeny arising from different ways of feeding the pregnant ewe (fetal programming). Using identical twins born to different ewes that were differentially fed to lose just over 1 condition score (about 7 to 9 kg of maternal live weight) in pregnancy and the progeny born were followed through to at least 4.4 years of age, showed permanent effects similar to that seen when twins are compared with singles.

<table>
<thead>
<tr>
<th>Relative performance of</th>
<th>Underfed versus maintenance</th>
<th>Twins versus singles (J. Greeff, pers. comm.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamb birth weight</td>
<td>-0.5 kg</td>
<td>-0.9 kg</td>
</tr>
<tr>
<td>Secondary follicles</td>
<td>-6 to -10%</td>
<td>-3% (Fibre density)</td>
</tr>
<tr>
<td>Clean fleece (lamb shearing)</td>
<td>-8% for underfed in pregnancy</td>
<td>-19% (greasy weight)</td>
</tr>
<tr>
<td>Clean fleece (adults)</td>
<td>-3 to -5%</td>
<td>-5%</td>
</tr>
<tr>
<td>Adult live weights</td>
<td>-1 to -5%</td>
<td>-3%</td>
</tr>
</tbody>
</table>

The plot-scale experiments conducted by *Lifetime Wool* have fine tuned our knowledge by defining dose responses to increasing availability of green feed from day 90 of pregnancy. It appears that the ewes own fleece production, as well as her progeny's birth weight, survival to tailing of twins, and quantity and quality of wool produced, reach a peak at between 1500 and 2000 kg of green dry matter on offer (see papers by Oldham and Ferguson at this conference).

These results indicate that a nutritional insult during the critical periods of growth and development of the fetus will permanently alter tissue structure and function.

**CONCLUSION**

Yes, nutrition throughout pregnancy is critical. Preferential feeding of the ewes at most risk – those bearing twins is clearly highly desirable. Whole farm economic analyses (2) show improved nutrition is worthwhile regardless of the time of lambing.

**KEY WORDS**

Pregnancy, nutrition, fetal programming, lifetime performance

**ACKNOWLEDGMENTS**

Our many colleagues in the WA “Reproductive Physiologists” team over the past 3.5 decades

**Paper reviewed by:** Norm Adams, Dave Masters, CSIRO

**REFERENCES**
Boost lamb survival – select for calm ewes

D Blache¹ (UWA) and D Ferguson² (CSIRO) 1. Animal Biology, University of Western Australia, 2. CSIRO Livestock Industries, FD McMaster Lab, NSW

ABSTRACT

Individual sheep have their own temperament/emotional reactivity. Some sheep are more at ease with isolation, novelty and close contact with humans (calm) whereas others display a more “nervous” disposition and have difficulties coping with these same situations. Previous studies have shown that calm ewes are better mothers and that lamb survival could be increased by selection for calm temperament. This paper reviews the importance of temperament with respect to lamb survival, describes a practical test to measure temperament, and reports on the heritability of temperament and its association with reproduction rate.

INTRODUCTION

Lamb mortality has both economic and animal welfare implications in sheep production. Strategies to improve lamb survival include nutritional management of the lambing ewe, timing of reproduction and selection of ewes for improved mothering ability. The quality of maternal care received by the lamb can be influenced a range of factors, including the capacity of the mother to cope with the stress of parturition and isolation from the flock. Isolation behaviour is in contradiction with the natural flocking behaviour of sheep. Previous studies have shown that there was a twofold difference in lamb mortality between breeding lines that had been selected for low (calm) or high reactivity (nervous) to isolation and human contact (1,2). However, the selection was based on the responses to 2 behavioural tests, the isolation box test (duration 1 min) and the arena test (duration 3 min), that are time consuming and not easily applicable on-farm. This paper describes: 1) the heritability of temperament as measured by a single measurement of agitation during the isolation box test (IBT) in 4 sheep breeds (meat and wool); 2) the development and validation of a portable and reliable on-farm test to measure temperament; and 3) the phenotypic correlations between temperament and reproduction rate.

REVIEW

Heritability of temperament

Temperament can be defined as the emotivity of “fearfulness” and the reactivity of an animal in response to human contact and/or novel or threatening environments (1). Based on an index from two behavioural tests, Murphy (1) calculated the heritability of temperament at 0.26 using an experimental flock bred over 3 generations (about 600 animals). We have since evaluated, using only the IBT, about 6000 sheep from 4 breeds (Merino, Border Leicester, Poll Dorsett and White Suffolk) on 24 commercial properties located in 4 states (NSW, VIC, SA and WA). The preliminary results on a subset of these data confirm that temperament is moderately heritable and that there is some variation between breeds of sheep (Table 1).

Table 1: Heritability of temperament as measured using the IBT in sheep breeds.

<table>
<thead>
<tr>
<th>Breed (N)</th>
<th>Merino (1539)</th>
<th>Border Leicester (1084)</th>
<th>Dorset and White Suffolk (798)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heritability (SD)</td>
<td>0.45 (0.10)</td>
<td>0.23 (0.07)</td>
<td>0.50 (0.13)</td>
</tr>
</tbody>
</table>

Development of the New Isolation Box Test

We have developed a more practical version of the IBT based on the original model developed by Putu (3). The new version is more compact and easier to use (Figure 2). We have also demonstrated that the duration of the test can be reduced to 30 sec without compromising the accuracy of the test. The modified IBT also includes a system that enables the calibration of the
agiotometers in the field. The repeatability of the modified IBT and another measure of temperament based on the measurement of flight time was evaluated a group of 340 weaners from the two temperament selection lines. Flight time is a very reliable temperament test for cattle and is based on the time an animal takes to break 2 infrared sensors 1-2 m apart on release from a weigh crate or IBT. The modified IBT was found to be highly repeatable which was in stark contrast with the poor repeatability of flight time (Figure 1).

Figure 1: Intra-class coefficients (repeatability) for the flight time measurements over 1 and 2 m, and modified IBT agitation score.

<table>
<thead>
<tr>
<th>New Isolation Box Test</th>
<th>Test</th>
<th>Repeatability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flight time over 1 m</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td>Flight time over 2 m</td>
<td>0.008</td>
<td></td>
</tr>
<tr>
<td>New Isolation Box Test</td>
<td>0.760</td>
<td></td>
</tr>
</tbody>
</table>

Interactions between temperament and reproductive rate

Over the last 4 years, under various climatic and nutritional conditions at the Allandale experimental farm, the ewes from the selection lines have been naturally joined to a single sire (1:30 ratio, no synchronisation, no flushing). The reproductive rate, expressed as the ratio of lambs weaned to ewes joined, was between 0.64 to 0.92 in the calm ewes and was greater by 10 to 20% than in the nervous line. The source of this increase in reproductive rate in the calm line is under investigation but increased lamb survival should account for most of the difference. Further improvement in reproductive performance will be possible with the addition of other strategies associated with reducing lamb mortality, such as focused feeding and the use of a “maternity ward”.

CONCLUSIONS

It is easy to select for temperament on-farm and thus increase reproduction rate by at least 10% in the absence of any targeted management strategies. The next step is to quantify the impact of selection for temperament on lamb survival in a variety of commercial situations, and this is the focus of our new research program.

ACKNOWLEDGMENTS

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Paper reviewed by: Keith Croker and Rob Kelly

KEY WORDS
Temperament, selection, welfare, reproductive performance, lamb survival

REFERENCES

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(3) Putu G (1988), Maternal behaviour in merino ewes during the first two days after parturition and survival of the lamb. 164pp. PhD Thesis, The University of Western Australia, Perth
Getting high marking percentages in WA
Keith Croker, Department of Agriculture, South Perth

ABSTRACT
The strategies used on two properties in the Great Southern area where marking percentages over the last three years have been well above the State average are presented. There is also mention of other options that could be used, following further investigations in on-farm studies, to increase the marking percentages on these properties. These provide practical examples of some of the issues raised in the previous papers.

INTRODUCTION
In New Zealand there have been significant increases in recent years in sheep performances (a 30% increase in marking percentages since the 1980s) which have offset the impact of declining sheep numbers (1). There is a similar need to increase the reproductive efficiency of ewe flocks in Western Australia. The average marking percentage in Western Australia between 1988 and 2003 was 75% (2). However, it is possible to obtain high marking percentages under some conditions, eg Cowcher Farms, Narrogin 95%; Blue Gums, Darkan 96%; averages for the last three years (2002 to 2004).

The management strategies used on these properties are examined in this paper and options for further increases are raised.

REVIEW
The results from Cowcher Farms and Blue Gums are recorded in the table:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cowcher Farms</th>
<th>Blue Gums</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ewes joined (No)</td>
<td>Lambs marked (%)</td>
</tr>
<tr>
<td>2002</td>
<td>7,235</td>
<td>94</td>
</tr>
<tr>
<td>2003</td>
<td>7,000</td>
<td>97</td>
</tr>
<tr>
<td>2004</td>
<td>7,014</td>
<td>94</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>95</td>
</tr>
</tbody>
</table>

Much of what is done with the sheep on both properties is fairly similar.

Rams are joined with the flocks relatively late (early in March) and they are taken out after 5 weeks. The rams are performance bred and are joined at a relatively high ratio (2.5 to 3%) after being fed lupins for 4 to 6 weeks before they are joined with the ewes.

The ewes are grazed at relatively high stocking rates during the growing season (10+ and 11 dse/ha on Cowcher Farms and Blue Gums, respectively). During late summer they are fed a small amount of lupins to maintain weight and condition score leading up to joining and during early pregnancy. Drenching of the ewes is done when worm egg counts are high. The ewes are shorn 2 to 3 weeks before joining and crutched when the lambs are marked. Ewes that do not lamb, or fail to rear a lamb, are culled.

At Blue Gums the maiden ewes are mated separately, but at Cowcher Farms the flocks have all ages of ewes in them.

Similar to New Zealand (1), nutrition is a significant factor affecting lambing performances of sheep in Western Australia. It would appear that the strategies used at Cowcher Farms and Blue Gums ensure that the ewes maintain weight and condition for mating which results in high lambing.
percentages. Ewes and rams are close to condition score 3 for joining (3), and the ewes maintain their condition during pregnancy and lactation (4).

The management of the flocks is aided by the relative short joining period on both properties. This allows more effective feeding of flocks and for the accurate scanning for numbers of fetuses in ewes, if this information is needed.

**Future**

There are some other strategies that might have a role in the future for increasing lambing percentages on Cowcher Farms and Blue Gums.

To maximise the chances of lambs surviving, especially twins, it is important to consider the paddocks used for lambing. It is crucial that there be plenty of feed available so that the lambing ewes don’t have to spend a lot of time searching for feed which may affect the maintenance of the bond between the ewe and her lamb(s). The availability of plenty of feed should also enhance the production of colostrum.

Shelter in the lambing paddocks is likely to benefit the new-born lambs, particularly when cold fronts pass. Protection can be provided by the regrowth in a cereal stubble paddock or where there are tall perennial grasses. The presence of these should reduce the wind-chill effect on new-born lambs.

Further investigations are also needed to measure the survival of lambs on farms where ewes are given high-energy rations at lambing in the expectation of getting an increase in the production of colostrum. This will need the use of an efficient strategy to feed ewes that does not induce mis-mothering of the new-born lambs.

The most exciting potential for improved lamb survival involves the breeding of flocks of ewes with a “calm” temperament (5). This genetic approach to the development of ewes with improved mothering abilities hopefully will reduce the problem of high mortalities of twin-born lambs. Studies are underway to evaluate the potential for selecting these ewes in a range of environments throughout Australia.

**CONCLUSION**

The marking percentages for the last three years on Cowcher Farms and Blue Gums have been well above the State average for the same period. It appears that the critical factor of an adequate nutritional status of the sheep is addressed on these properties. The use of other developing strategies in the future could result in further increases in marking percentages on these properties providing that the resulting grazing pressure doesn’t compromise the outcome.

**KEY WORDS**

Marking percentages; time of joining, nutrition, lamb survival

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Healthy, Welfare and Wise!

Di Evans, WA Department of Agriculture

ABSTRACT

The recent focus on animal welfare in the sheep and wool industry has been highlighted by calls to ban live export and mulesing. Animal welfare is a challenging area of responsibility for all livestock industries. It carries potential serious consequences if urgent and/or important issues are not appropriately addressed. Welfare issues can have a far reaching impact involving political, legal, cultural, social, market, economic and practical implications. The environment in which issues are raised can also greatly influence problem solving processes and resultant outcomes.

The wool industry would benefit greatly by becoming more pro-active in identifying key welfare issues and working through these using a structured approach in order to gain real improvements in, and demonstrate a commitment to, animal welfare. A valuable exercise would also be to review and evaluate responses to welfare issues to gain an insight into outcomes that were successful and those that have been less so. This paper examines the factors that have influenced industry response to, and the resulting outcomes of, two different welfare issues – mulesing accreditation and stock transport fitness.

INTRODUCTION

Overseas, animal welfare emerged as an important issue for livestock industries overseas many decades ago. This was largely initiated by the Brambell Report which was published in the UK in the mid 1960s and focused on the welfare of intensive livestock production systems (1). This report questioned many accepted practices in relation to housing, husbandry procedures and the perceived lack of fulfilling basic animal physiological and behavioural needs. Today, many of the same questions are still being raised with respect to intensive as well as extensive production systems. Australian livestock industries, until recently, have been relatively untouched by the ‘welfare machine’. However, with the current focus on mulesing and live export, the times ahead are likely to be very challenging in terms of balancing consumer expectations, welfare considerations and management practices.

A major obstacle facing the sheep and wool industry is the attitude and perspective with which welfare is considered. Unfortunately, the recent attack on livestock industries by animal rights extremists has not promoted a positive approach towards animal welfare problems. Polarised views are likely to result in resentment, anger and reluctance to constructively and genuinely resolve conflicts. On the other hand, some important issues may not have been addressed with the same urgency if media attention had not raised awareness and general concern.

Being pro-active rather than reactive, and being genuinely committed to improving welfare standards, will greatly assist industry to counteract criticism, defend current practices and to have a greater influence in determining the future changes. It is no longer sufficient for farmers to justify their practices saying, “of course we treat animals humanely – just look at how healthy they are”.

IMPLICATIONS OF WELFARE ISSUES

Due to the wide range of groups and organisations concerned with the treatment of animals, welfare issues can have a far reaching impact involving legal, economic, market, practical, social, cultural and political implications. Some of these aspects are outlined below.

Legal

Legal aspects relating to animal welfare are complex and may appear to be overwhelming. The legal framework consists of two levels – Acts and their associated Regulations, and Codes of Practice. It is interesting that welfare legislation is a State not Commonwealth responsibility, whereas development of welfare Codes is the responsibility of a national body, the Animal Welfare Working Group.
comprising of State agricultural department representatives. However, adoption of Codes is undertaken by the State government agency responsible for animal welfare. Currently in WA, compliance with Codes of Practice can be used as a defence against a charge of cruelty.

For Western Australia, the Animal Welfare Act 2002 and Regulations 2003, plus welfare Codes are the responsibility of the Department of Local Government and Regional Development. For welfare issues that are deemed to be significant, Codes of Practice may be developed or modified as a minimum response, but may also involve changes to the Regulations or possibly the Act. For livestock industries this could have serious consequences. A fundamental imperative for industry is to take a lead role in the development and review of Codes of Practice by ensuring a high level of industry input, particularly from members with technical expertise in specific areas. This process has commenced but requires broader circulation and opportunity for consultation with producers. Another important responsibility for industry is to ensure that the next generation of farmers is exposed to Codes of Practice and understand their importance and role in promoting good welfare standards in livestock production. This exposure for the coming generation can be achieved by developing and promoting a balanced, practical welfare module in the agricultural training curriculum as well as ensuring that welfare is integrated and strongly emphasised in existing modules.

Economic

The economic impacts of specific welfare issues may include restrictions on market access, tarnishing a product image as well as the industry as a whole, and also the requirement to alter current practices that may incur greater costs and/or a reduction in productivity. However, the converse of this is that despite some market closures, others may be created and despite initial reaction that change in practice will probably result in increased costs, this may not be the case. There are many examples where improvements in welfare have increased productivity, particularly in areas of stock handling and husbandry (3).

Practical

One of the most challenging areas in responding effectively to welfare concerns is to identify practical solutions that can be implemented. There are many options to consider. These include developing viable alternatives, refining current techniques by increasing skill levels or improving equipment or modifying management to avoid the need to continue a practice that has come under scrutiny. In some instances, where industry has accepted that a welfare problem exists and has been committed to resolving it, the most practical and cost-effective solutions have been developed by those closely associated with the problem. For example, improving yard design has reduced stress experienced by stock and has improved safety and efficiency for stock handlers (4).

Responding to welfare issues

Animal welfare issues involve many people and organisations who have different perspectives and imperatives. These perspectives are usually polarised which creates major obstacles in finding mutually agreeable solutions. When livestock industries are challenged by animal welfare/rights groups, it is often difficult to reach a compromise that will address highlighted welfare concerns and yet not impose significant economic and impractical restraints. Agreeing on a course of action that is fair and reasonable as well as effective can only be achieved if all parties agree to work together towards a common goal. Establishing key networks and implementing collaborative initiatives with recognised welfare affiliated groups such as the RSPCA, the Australian Veterinary Association and government welfare bodies will greatly assist industry to demonstrate a commitment to welfare in a positive and constructive manner. In addition, securing funding for welfare projects is considerably easier if activities are undertaken in partnership.

Industry can choose one of two approaches to address welfare issue – to either be pro-active or reactive. Either option offers advantages together with some risks. If an industry is pro-active, then welfare issues that may not have been well recognised might become a focus of attention and the industry may be forced to raise welfare standards higher and at a greater cost. This has probably been a major factor in industry declining a pro-active approach. However, not all initiatives need to be such high profile that they will attract attention. The major benefits of dealing with issues in a pro-active way are that the industry will have more control on the direction and rate of change that may be required, it can provide an immediate positive response to criticism stating that measures have already been undertaken and it can demonstrate a support base of support by forming alliances with key groups in dealing with these issues.
One effective strategy to address welfare concerns is to undertake a welfare audit on a whole of industry basis and to then audit specific issues that have been identified (5). This process was initiated several years ago through a meeting of key stakeholders where key welfare issues were identified for the sheep industry (6).

A reactive approach has many pitfalls. These include the inability to respond quickly, effectively and with a unified front, as well as losing control over the direction of the debate and the very likely impact of negative publicity. Rapid and effective communication with all sectors of the industry is a challenging, time consuming and expensive process and so often timeframes to implement changes do not allow for adequate consultation. This can lead to poor decisions being made and usually poor use of resources and funds. Being reactive very often means being defensive. With welfare issues, defending specific practices to those outside the industry is extremely difficult and often ineffective. What the industry accepts as a routine preventative treatment can be viewed by the others as being incomprehensible and barbaric.

**Mulesing training and accreditation; a reactive approach**

Over the past eighteen months, the wool industry has been faced with responding to threats by ‘outsiders’ to ban mulesing of sheep. The announcement by the sheep industry in November 2004 to phase out mulesing out by 2010 has been criticised by many as being too reactive in light of no viable alternatives being available in the foreseeable future (7). No doubt this is a multifaceted issue with some welfare aspects relating to mulesing other than just seeking non-surgical alternatives, being ignored. Had these been addressed decades ago, the industry would have been in a strong position to defend and/or reduce reliance on the practice (8).

For the past 25 years, formal mulesing training has not been readily available to the industry. During the 1970s, most State government agricultural agencies provided mulesing instruction but this ceased by the early 80s. Then very little was done to develop a national training program. In 1994, the Livestock Contractors Association (LCA) implemented a mulesing training and accreditation program mainly for contractors. The LCA recognised a significant need for training due to the generally poor and inconsistent standard of mulesing being performed and also to address major welfare concerns relating to the practice (9). Due to financial constraints, the LCA, (based in New South Wales) was unable to expand the program into other States until AWI funding was made available from AWI in 2004 under the National Mulesing Project (10). Providing training in mulesing is very costly due for several reasons. There is a restriction on participant numbers attending owing to the high level of supervision required during practical sessions, high travel costs associated with remote delivery, the use of NSW based trainers in other States due to limited numbers of suitable local trainers and the need to undertake assessment at least six weeks after the training.

Over the past six months, there has been a push for mulesing accreditation to become compulsory. The sheep industry has been ill-prepared to respond effectively to this pressure and the call for welfare standards to reflect that mulesing is being performed humanely and only by skilled operators. By not taking a pro-active approach, the industry has placed itself in a very vulnerable position. Irrespective of extreme animal rights criticism, it could be fair to say that the sheep industry has not taken its responsibilities on this issue seriously. Earlier recognition of the need for and the implementation of, a formal mulesing training program would have shown the industry’s genuine commitment to animal welfare and would have provided a stronger basis to defend the continuation of the practice. Unfortunately it can be shown that, very little has been done to ensure that mulesing is done as humanely as possible.

Only this year, under the National Mulesing Project, has a set of national guidelines been developed, competencies produced and a team of State-based mulesing trainers established. Due to the current environment, there has been confusion and disagreement leading to major delays in finalising these crucial initiatives. Sadly, funding for fast-tracking of the LCA training and accreditation program has not been finalised. Because the industry has reacted to this issue, many aspects have not been handled satisfactorily, particularly in terms of providing effective welfare improvements. Serious reflection on the handling of this issue must help the sheep industry to identify better ways of approaching animal welfare problems in the future.

**Stock transport guide; a pro-active approach**

About the same time that mulesing came into the spotlight, another welfare issue was being pursued. The RSPCA (WA), through the efforts of a district inspector, approached the WA Department of Agriculture to develop a plan to reduce the number of ‘unfit’ stock being transported, including stock...
with injuries, in poor condition and/or in late pregnancy. The main problem identified was that despite the term 'fitness for transport' being referred to in codes of practice, it is not adequately defined. The initial phase of the plan was to ensure sufficient consultation with key industry groups. The intention was to produce a pictorial transport guide to assist producers, transporters, stock selling agents and saleyard personnel to decide on the fitness of stock to be transported. The concept was well received and key stakeholders were instrumental in developing the content of the guide. This process proved very successful and at the conclusion of the meeting, agreement was reached on the categories and acceptable limits for determining stock fitness for transport. Over the following six months, funds were committed by most of the industry groups involved, as well as government and the RSPCA to develop and publish the guide.

The livestock transport guide was launched at the Dowerin Field Day in August 2004 with over 10,000 copies being released. It has been enormously successful with a second edition being produced in June 2005. Each industry group has fully embraced and promoted the document widely. In addition, several reports have been received that indicate that the guide has reduced the incidence and severity of cases of unfit stock being transported. Reports include saleyard personnel noting a significant reduction in the number of stock being destroyed or confined to the pet food pen, abattoir staff observing fewer animals with injuries being presented for slaughter and a pet food operator reported receiving requests for stock to be destroyed on the property rather than being transported to the pet food premises. The transport guide also accompanies letters to stock owners who supply animals that are destroyed at saleyards to raise awareness of their responsibility.

Further, the guide has been well received both nationally and internationally with keen interest from New Zealand and in Paris where several countries attending an OIE (World Animal Health Organisation) meeting on animal welfare commended the publication. In Australia, several States are keen to develop and distribute their own guides.

Despite being essential documents in outlining key welfare requirements, Codes of Practice are not generally ‘user friendly’ in providing practical guidance to help address real issues. This is a well recognised problem but has not been sufficiently pursued. The stock transport guide demonstrates that a supplementary document, with strong industry support and involvement can be a very practical and effective method of reducing welfare problems. Other strategies could be adopted to further improve the welfare of stock being transported including development of an easy-to-use reference for feed and water withholding periods, as well as rest and inspection stops.

The example of the stock transport guide highlights the very positive aspects of a collaborative, pro-active approach in dealing with a welfare issue.

CONCLUSION
Being pro-active on welfare issues can greatly assist industry to improve welfare standards as well as minimise negative impacts that would otherwise occur if little and/or ineffective action was taken.

KEY WORDS
Animal welfare, pro-active, industry response

Paper reviewed by: Michael Paton, WA Department of Agriculture & Lyndy Scott, Consultant.

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