Sheep Welfare – no easy issues

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Farm Animal Welfare

- Future livestock production
- Sheep
  - Positive – expensive meat
  - Provenance important
  - Facebook – Prevent horrors
- EU Welfare Quality Assessment

SHEEP welfare

- PHYSICAL ENVIRONMENT
  - Drought, snow, winter feed, lambs
- SOCIAL CONTEXT
  - Marking, transport, slaughter
- FINANCIAL CONSTRAINTS
  - Human:Sheep ratio, individual sheep issues (bearing, dystocia), triplets
- BIOLOGICAL POTENTIAL
  - Disease (Johnnyes, Flystrike, footrot)
- MANAGEMENT OPPORTUNITIES
  - Human behaviour, dog management, shearing

Background to NZ sheep farming

- Traditional sheep farming - lamb and wool using dual purpose breeds
- Coarse wool prices decline
- Lamb price static

Response

- Sheep farmers on good land changing to dairy farming and on less good land they are grazing dairy heifers
- Poorer country still concentrate on lamb production (plus bull beef, deer, trees, honey)
- Increase in farm flock size and ewe:human ratio (10,000SU:shepherd)
Sheep and Beef Farms

- The average sheep and beef farm has about 3-4,000 ewes and 50-150 beef cows

The ‘horrors’

- Less time per individual animal
- Cast ewes (incidence/deaths unknown)
- Prolapsed vagina (incidence 0-6%, treatment and mortality?)
- Flystrike (3-5% year, mortality %?)
- Ewe mortality 5%?? (Lambing)

Ewe Dystocia

- NZ; Hoggets (Kenyon et al., 2007)
  - 7% assisted,
  - 2% die
- Wales; Ewes (Evans and Scott, 1999; Scott, 2003)
  - 4.8% assisted
- 50% assisted in some European flocks (West, 2009)

Dystocia

- NZ (Fisher 1997)
  - Assisted, 10% down to 2%
  - Ewe mortality figures difficult to get, 2% often quoted, probably low
- Wales (Evans and Scott, 1999; Scott, 2003)
  - Ewe mortality during lambing 3.8%
  - In 0.5% of ewes the lambs could not be delivered by farmer (359/76,610)

How painful is dystocia for the cow? (Laven et al 2009)

- Veterinarians ranked dystocia requiring traction as 7/10 on a pain scale (1= no pain; 10= severe pain)
- Dehorning = 8/10

But (Evans and Scott, 1999)

- In Wales with a dystocia rate 4.8%, 79.3% of ewes assisted by the farmer died
- Why?
- Why bother?
What if dystocia not attended to?

Ewe may eventually give birth or become recumbent, toxic and die

Research

- The experience of Dystocia has not been studied
- Reducing dystocia is a constant need – genetics, management
- The economics or success of treatment is poorly quantified
- Euthanasia may be an answer to (difficult) dystocia

Marking

- Tailing
- Castration (20,40,40%)  
- Time per lamb
- Pain relief  
  - Local anaesthetic delivered by ring or specific device
  - Easy design if commercially viable and a necessity for market access

Increase flock size

- Research needed to manage flocks better to minimise problems
- Better preparation for drought, snow, climatic issues
- Disease prevention  
  - Footrot 4-8% sheep;
  - Johnies disease;
  - Parasites;
  - FE;
  - etc

Increase flock size

- Research to improve sheep handling equipment for restraint to allow foot trimming, crutching, dagging, fly treatment
- Research on shepherds, contractors who do shearing, docking, bolus administration, scanning etc

Increase flock size

- Remote monitoring  
  - weight
  - BCS
  - Motility
  - land use
  - location
  - ID sick
  - Kill the dying
A research story: Increase lamb production

- In the 1990s inclusion of fecund breeds (Finnish Landrace, East Friesian) into base flock
- Increase in fecundity from national mean lambing % of 100 in 1990 to 128 in 2005
- Increase in twins and triplets

Productivity Comparison

<table>
<thead>
<tr>
<th></th>
<th>1990-91</th>
<th>2006-07p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lambing Percentage (ewe)</td>
<td>101.6</td>
<td>117.9</td>
</tr>
<tr>
<td>Average Lamb Wt (kg)</td>
<td>14.35</td>
<td>16.90</td>
</tr>
<tr>
<td>Lamb sold Kg / Ewe</td>
<td>9.76</td>
<td>16.83</td>
</tr>
<tr>
<td>Wool kg/head</td>
<td>5.28</td>
<td>5.60</td>
</tr>
<tr>
<td>Average Steer Wt (kg)</td>
<td>297</td>
<td>320</td>
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</tbody>
</table>

Increase lamb production

- Above 170% triplets replace singles
- Extensive lambing and poorer country
- Lamb mortality increase with fecundity

Lamb mortality – ethical and welfare issue (Mellor and Stafford 2004)

- High mortality
  - Harsh reality of extensive lambing
  - Unacceptable and needs to be reduced
- High mortality – welfare issue
  - Stillbirths – dystocia
  - Die before fully conscious
  - Die after feeding
  - ‘Horror’

Lamb awareness (Kerslake et al 2005)

- Post mortem on lambs dead before 3 days of age
  - 70% had breathed (30% stillborn) 30 not aware
  - Of these 23% never walked 16 aware?
  - Of the walkers 55% had not fed 30 aware?
  - Fed and walked 24 aware

Lamb mortality: farmers (Everett-Hincks, 2004)

- Farmers consider lamb survival to be most important trait affecting farm profit
- Above 230% drop in farm profitability
- Cost NZ$264 million / year
Management (n/day) (Everett-Hincks et al. 2001)

- Good farmers (mean weaning 143%)
- Farmers shepherded ewes
- Mixed age ewes – low and high producers
  - Low
  - High
- Single <1.5
- Twins 1.7
- Triplets 1.7

Lamb mortality - survey (Everett – Hincks et al 2001)

- Good farmers (mean weaning 143%)
- Lambing % > 150% (Coopworths) OR < 150% (Romney)
- 81%(L) to 84% (H) ewes raised all lambs
- Similar lamb losses (%)
  - Day 0-2
  - Single 7
  - Twins 11
  - Triplets 10

Lamb survival to weaning (%)

<table>
<thead>
<tr>
<th></th>
<th>Single</th>
<th>Twins</th>
<th>Triplets</th>
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</thead>
<tbody>
<tr>
<td>Kenyon et al. 2002 (Romney 1030)</td>
<td>83</td>
<td>80</td>
<td>59</td>
</tr>
<tr>
<td>Thomson et al. 2004 (Mixed breeds 3376)</td>
<td>90</td>
<td>88</td>
<td>76</td>
</tr>
<tr>
<td>Everett-Hincks et al., 2004 (Coopworth stud 4000)</td>
<td>89</td>
<td>94</td>
<td>76</td>
</tr>
</tbody>
</table>

- Mortality 10-17
- (From West et al. 2009)

Lamb mortality (Kerslake et al. 2005)

<table>
<thead>
<tr>
<th>Mortality rates of lambs of different birth weights</th>
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<tbody>
<tr>
<td>All</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Primary Dystocia</td>
</tr>
<tr>
<td>Starvation/Exposure</td>
</tr>
<tr>
<td>Unknown</td>
</tr>
<tr>
<td>Secondary Dystocia</td>
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Gross pathology – may overestimate dystocia
Lambs up to day 3 of age – 20 flocks

Scanning
Cull empties – reduce feed pressure
Manage single, twin and triplet bearing ewes differently
Feed single ewes to manage lamb size?

Triplet lamb mortality (Morel et al. 2008)

- Mortality rates of lambs of different birth weights
  - light 56%
  - medium 40%
  - heavy 28%
- Lightest lamb 3.2 times more likely to die
- Mortality depends not on birth weight of light lamb but its % of total litter weight (the higher the % the lower the mortality)
  (Competition for teat access at letdown?)
Triplet lambs (Stafford et al 2007)

At birth triplets lighter, lower PCV, plasma fructose and thyroxine, lower rectal temperature and and higher plasma lactate than twins. 
The lighter triplet was lighter and had higher lactate than largest triplet 
Order of birth had not effect on weight or biochemistry

So what to do?

Increasing birth weight?? (smaller triplet usually 3.5 to 4 kg)
Reduce triplets OR Even out birth size differences??
Milk yield (Competition)
Shelter (note Rectal temp)
Manage smaller triplet lamb foster/hand rear/feed bolus/kill it

Increase birth weight – Nutrition during pregnancy (Kenyon et al 2010)

- Ewes fed sub-Maintenance, Maintenance or ad lib day P21 to P50 and thereafter M +Pregnancy = no effect on birth weights or survival (Kenyon pers comm)
- Ewes fed concentrates plus ad lib pasture in late pregnancy = lower twin weight but greater triplet weight but no effect on weaning weights

Increase birth weight

- Mid pregnancy shearing increases birth weights in twins by 5-26% but data on survival to weaning or weaning weights mixed (0 to +3%)
- Second shearing expensive and may not be done for $ reasons but ewes usually crutched, and prevent being ‘cast’ though hypothermia may be an issue.

Late pregnancy and early lactation feeding

- Feeding chicory/plantain/clover sward OR ryegrass/clover from 2 weeks before birth
- Increased milk yield and heavier lambs at days 22 and 66 of life (Hutton et al. Pers comm)
- Increased lamb survival - and weaning weight (Kenyon et al. 2010).

Herb sward = better survival and growth WHY?

- Maternal behaviour – well fed, settled, birth site
- Shelter – cover lambs for first few days
- Milk yield
- Lamb competition not so significant
Other avenues of thought

- Periconception – epigenesis – feed tannins?

- Larger ewes with larger lambs, more milk, better maternal drive, and fewer per hectare (plus lots of feed at lambing and shelter)

Sheep welfare research to reduce the ‘horrors’

- ‘Animal Science’
- Reduce dead lambs
- Deal with dying ewes
  - Bearings
  - Dystocia
  - Disease
- Droughts etc
- Dogs
- Happy sheep are pain free, well fed and comfortable

Thank you