

Response to a poor season

Analysis of options for sheep producers

Executive Summary

There are a couple of provisos for the following comments:

1. The price of sheep doesn't reduce substantially over the next 12 months. This is not expected but it is a risk and therefore selling low priority stock is recommended. Low priority sheep are: dry sheep, wether weaners & old ewes >6yo.
2. That confinement feeding is done with reasonable technical skill and that feed isn't wasted and that animals don't die at high rates.

At the same age which are the higher priority to keep, fat or thin ewes?

The priority for retaining or selling good condition ewes versus thin stock depends on the current relative sale prices. Animals that are currently in good condition have a higher sale value but require slightly less grain feeding. If the thin ewes are fed to gain weight and the good condition ewes fed for maintenance then they will be equivalent at the end of the year. A CS2 ewe gaining 0.7CS requires about 200MJ more supplement than a CS2.7 ewe maintaining for 12 months. At 2.5c/MJ that is \$5/hd so a premium greater than this for good condition ewes indicates to retain the thin and sell the fat.

However, low condition ewes will be more difficult to manage because there is less margin for error. Therefore, the decision on selling or retaining the thinner ewes is associated with the quality of management of the thin ewes in confinement.

Does it pay to maintain ewes using grain this year?

Definitely. All ewes that will be mated next year can profitably be fed for maintenance and in many cases, it will pay to feed to gain weight.

Ewes that aren't going to be mated can only be profitably retained in the flock if the rebuilding margin (increase in value of sheep next year) is greater than \$60/hd. This margin is high and indicates that retaining thin ewes that won't be mated will probably only be break-even.

If the property has be partly destocked this year then long term analysis indicates that the rebuilding margin is approximately \$40/hd if sheep prices don't increase.

For early lambing flocks that will only have dry feed from now till next lambing, will it pay to have ewes in confinement for 12 months?

Yes.

Maintaining the ewes in confinement and mating & lambing in confinement and providing a full ration will be profitable. If the ration costs 2.5c/MJ (Lupins \$350/t, Barley \$310/t, Hay \$200/t), the cost of supplement (\$110/hd) and husbandry (\$25/hd) is offset by the value of the ewe wool production and the value of lambs weaned. The profit is achieved from the rebuilding margin associated with the increase in value of the ewe retained (sale value this year compared with value next year).

Furthermore, the cost of grain feeding may be reduced if some stubble is available or some spring pasture growth is achieved and the sheep can be out of confinement for some period during the 12 months.

If the cost of the ration is 3c/MJ, then the breakeven period in confinement is reduced to 10 months (= May next year).

Does it pay to put weight on ewes using grain feeding?

In most situations, high priority ewes gaining weight in confinement will be profitable. The priority is the same as the priority on green.

Feeding maidens (and other low CS ewes) to gain weight if they are too thin to mate is a high priority and would increase profit by about \$60/hd compared with retaining and not mating.

The breakeven for feeding to gain weight is at CS 2.7 i.e. ewes at CS2.7 or above should be fed for maintenance, all others can be fed to achieve a CS of 2.7 by next joining.

What is the priority for the limited green feed this spring

1. Having "at risk" weaners gaining weight is the highest priority. Gaining 1kg/month is sufficient and above this the value of further weight gain drops to between 20c and 50c/kg.
2. Ewes that are currently too thin to mate (CS < 2.3) are the highest priority adult sheep (\$15/kg). Depending on relative prices these ewes may be a low priority to retain, but if they have been retained then they are a high priority to feed.
3. Thin ewes (CS 2.5) being mated to merinos, especially if they had twins in 2017 are the next priority (\$2.90/kg).
4. Ewes in CS 3 or more and ewes to be mated to a terminal sire in CS 2.5 (\$2.40/kg)
5. Lambs being fattened for sale are next (\$2/kg)
6. CS3 ewes to be mated to a terminal are a low priority (\$1.90/kg) (although it still pays to feed for maintenance)
7. Ewes being fattened for sale are the lowest priority

Note: Shedding breeds are a similar priority to merino ewes mated to a terminal sire.

There is a lack of data regarding death rates of older ewes by CS at lambing, but it is likely that older ewes are more sensitive to low CS. Therefore, older ewes – if they are being retained – will be a higher priority for high quality feed than the younger ewes.

Segregating ewes on CS and allocating feed appropriately is a high value process this year.

Some background figures

- With current wool prices 50% or more of the grain fed for maintenance is recouped in wool income.
- Short term weight gain for sale stock in a well-run feed lot is profitable. So, the price of thin stock shouldn't plummet because there will be willing buyers to purchase, fatten and sell.
- Previous MIDAS analysis showed that extra merino lambs were worth \$50/hd and extra meat lambs \$75/hd if the lamb price was \$5/kg DW. These values increased to \$65 and \$90/hd if the lamb price was \$6/kg. The analysis also showed that during a rebuilding phase the value of extra merino lambs increased up to \$90/hd (at \$5/kg). Rebuilding didn't alter the value of extra meat lambs because the lambs were being sold and were not available to 'rebuild' the flock.

For this analysis, a value of \$100/merino lamb has been used. This reflects that next year most flocks will be rebuilding and that meat prices are likely to be higher due to a shortage of supply. A value of \$100/lamb has also been used for meat lambs to reflect the higher prices expected.

The rebuilding margin that is reflected in the price of the lambs, ewes, hoggets and wethers will play out in one of three ways for flocks

1. Flocks buy in replacement ewes at a higher price next year
2. Flocks sell less high value sheep next year in order to rebuild the flock
3. Properties do neither of the above but they are understocked and have lower income.
4. If animals aren't sold this year then higher prices are received next year so the normal level of stock turn-off receives premium prices.

Note1: The rebuilding margin is reduced if there are profitable alternative land uses. In the past, this would have been crop, but crop areas are already high so can it be profitably increased further?

Note2: The rebuilding margin is increased if the farm is understocked for a number of years and livestock are retained that would in normal circumstances be sold.

- The increment in feeding to gain LW or reduce LW loss is less if animals are being confinement fed. Therefore, if it is profitable to maintain weight (or gain weight) on pasture it will be profitable when confinement feeding.
- Furthermore, sheep will expend 1 to 2 MJ/d walking when feed is scarce. If FOO is low and quality is poor then less concentrate will be required for maintenance in confinement than on the paddock. This is also environmentally sensible, so profit and the environment are aligned.
- Joining ewes in CS less than 2.3 is an animal welfare risk and also a profit risk. Ewe deaths can be very high which means not mating ewes with CS < 2.3 is recommended.
- Rules of thumb for level of grain feeding

Table 1: Amount of extra feeding required (MJ) to meet a LW change target. The increase in feeding above the level currently being carried out.

	Fed on pasture MJ (kg)	Confinement feeding MJ (kg)
To reduce LW loss by 1kg	40 (3)	25 (2)
To achieve LW gain of 1kg	100 (8)	50 (4)
To maintain a 1kg heavier animal (during preg & lact)	30 (2.5)	28 (2.3)

Feeding on pasture requires more MJ fed because

1. Animals expend more energy walking when grazing on pasture
2. A higher proportion of the grain offered is wasted in the paddock
3. Supplement offered in the paddock reduces intake of the pasture. Therefore, an extra 1 MJ of supplement consumed results in less than 1MJ of extra intake. The magnitude of this effect depends on the quality and quantity of paddock feed available.

Profitability of retaining ewes

Background

The decision to retain ewes or sell is in part associated with the impact on profitability. This analysis examines the impact of retaining ewes of varying initial condition score if the period of time on grain feeding varies.

The price of grain also effects the profitability of retaining stock. The breakeven price of grain has been calculated for different periods of feeding.

Both of the above have been analysed for ewes with an initial CS of 3 for 3 scenarios:

- Feed in confinement, including pregnancy and lactation
- Feed in confinement but pregnancy and lactation on green feed next year
- Feed on a bare paddock with pregnancy and lactation on green feed next year

The analysis values the increase in profit if each class of stock gains a kilogram of weight during the spring period in the lead up to joining.

Data / assumptions

Reproductive rate = $f(\text{CS joining, reproductive status in 2017})$ see Figure 1

Birth weight = $f(\text{LW}_{\text{JOINING}}, \text{LWC}_{\text{J-D90}}, \text{LWC}_{\text{D90-LAMBING}})$ see Table 2

Lamb survival = $f(\text{Birth weight, Birth rank})$ see Figure 2

Weaner survival = $f(\text{Weaning weight, Post weaning growth rate})$ see Figure 3

Ewe mortality = $f(\text{LW}_{\text{LAMBING}}, \text{Litter size})$ see Figure 4

Ewe wool production = $f(\text{LW}_{\text{JOINING}}, \text{LWC}_{\text{J-D90}}, \text{LWC}_{\text{D90-LAMBING}})$ see Table 3

Progeny Wool Production = $f(\text{LW}_{\text{JOINING}}, \text{LWC}_{\text{J-D90}}, \text{LWC}_{\text{D90-LAMBING}})$ see Table 4

Weaning percentage 85%

Wool value \$45/hd

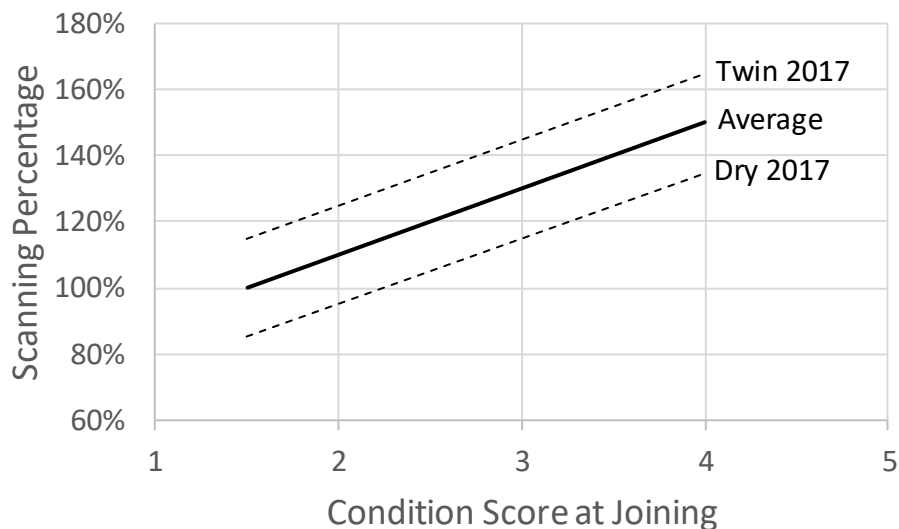


Figure 1: Relationship between CS at joining and reproductive rate (scanning percentage).

Table 2: Coefficients to calculate the impact of ewe CS profile on birth weight of lambs

Period	Impact on BW
LW at joining	+0.027
LWC join to D90	+0.033
LWC D90 to lambing	+0.045
Twin born	-1.12

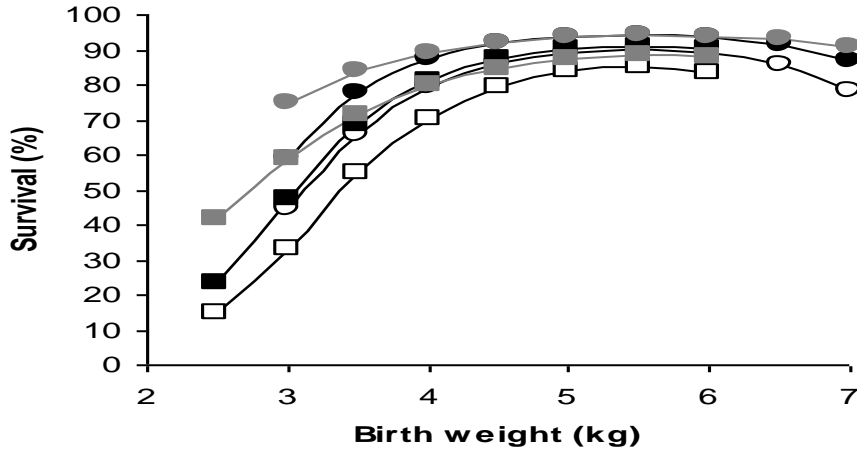


Figure 2: Predicted lamb survival to 48 hrs in terms of lamb birth weight and progeny sex effects (fixed) after adjustment for sire, day of birth and blocking effects (random) for the VIC sites. The combined responses for 2001 and 2002 are single female (○), single male (◻), twin female (◐) and twin male (◑). In 2003 there was no effect of sex and responses are shown for singles (○) and twins (◐). Source: Lifetime Wool, Final report.

The majority of weaner deaths occur in the first 4 months after weaning, therefore these 4 months are the critical period. Weaners growing at 250 g/month are at a high risk and have a low survival (Figure 3) Increasing their growth rate by 1 kg/month lifts them to a low risk region and increases survival by 30% - 55% depending on weaning weight.

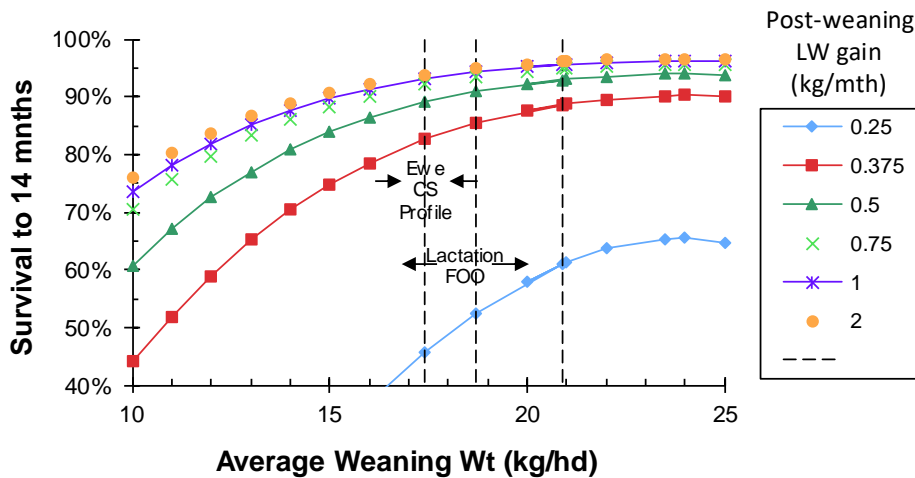


Figure 3: Relationship between weaner survival and weaning weight and post weaning growth rate. Source Angus Campbell pers. comm.

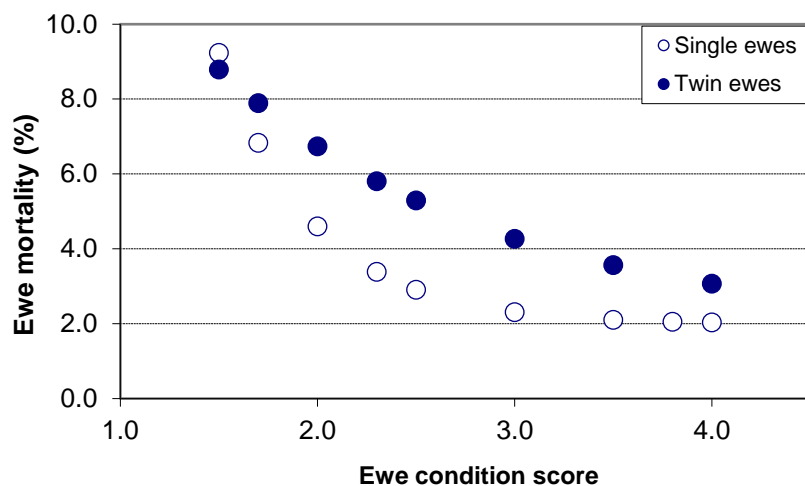


Figure 4: Impact of CS at lambing on death rate of single and twin bearing ewes

Table 3: Coefficients to calculate the impact of ewe CS profile on ewe fleece growth

Period	CFW	FD
LW at joining	0.051	0.084
LWC join to D90	0.071	0.097
LWC D90 to lambing	0.065	0.083
LWC lambing to weaning	0.040	0.052
Rear class Twin-Single	-0.088	0
Rear class Twin	-0.124	0

Table 4: Coefficients to calculate the impact of ewe CS profile on the fleece production of the progeny

Period	CFW	FD
LW at joining	0.010	0
LWC join to D90	0.019	-0.031
LWC D90 to lambing	0.019	-0.036
Rear class Twin-Single	-0.143	+0.128
Rear class Twin	-0.274	+0.482

Results

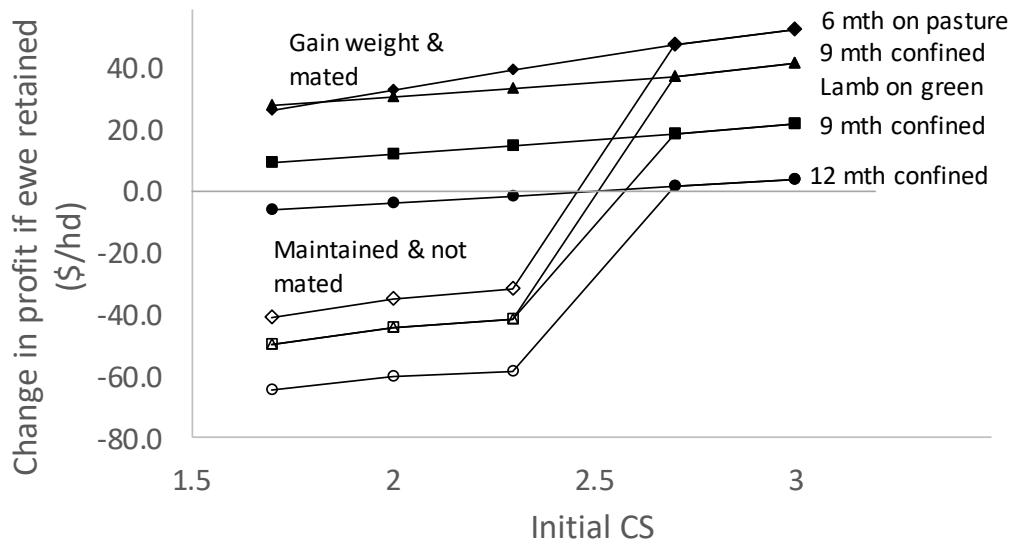


Figure 5: Change in profit if a ewes are retained, with varying initial CS and different periods on feed.

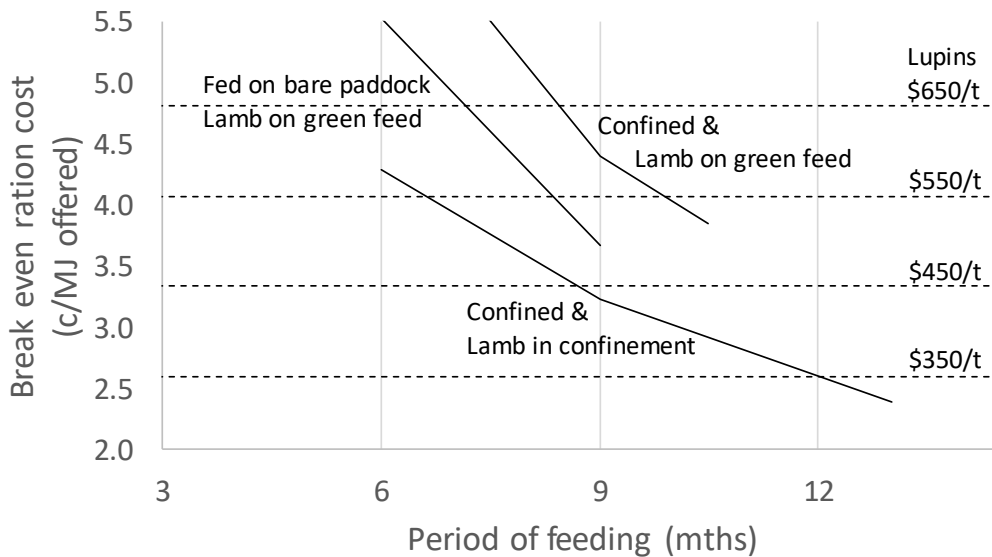


Figure 6: Breakeven ration cost (c/MJ as offered) with varying periods on feed.

Conclusions

Retaining ewes that require 12 months feeding in confinement is breakeven (Figure 5) if the rebuilding margin is ignored and the cost of the ration offered is 2.5c/MJ (3.1 c/MJ consumed). Initial CS has a small effect with high CS ewes being more profitable. If less than 12 months feeding is then retaining ewes is significantly more profitable. Note: These calculations ignore the rebuilding margin which could add a further \$20-\$40/ewe to the calculated margin.

The profitability of retaining ewes is also affected by the price of the ration offered and this affects the period of feeding that is profitable. The shorter the period of feeding that is required the higher the price of the ration that can be afforded and still breakeven (Figure 6). If 9 months is required in

confinement, then the breakeven ration cost is 3.2c/MJ if the ewes will be pregnant and lactating in confinement or 4.4c/MJ if the ewes are likely to have green feed during pregnancy and lactation.

Priority stock for LW gain

Background

If some green feed is available during spring or high quality stubbles after harvest then it is necessary to prioritise which stock classes provide the best “bang for the buck” for this limited quantity of high quality pasture or stubble. The stock classes assessed in this analysis were

- Mature ewes with varying initial CS, reproductive status in 2017 and ages.
- Ewe hoggets that could be mated
- Weaners for growth and sale
- Weaners being retained

The analysis values the increase in profit if each class of stock gains a kilogram of weight during the spring period in the lead up to joining.

Results

The value of increasing LW of different classes of animals varies and the sheep classes can be prioritised in profit (Table 5). The difference in profit for utilising the higher quality feed between low and high CS sheep maybe further increased by accounting for the amount of LW gain per kg of high quality feed. Low condition ewes are likely to gain more weight when offered high quality feed than ewes already in good condition. The thin ewes will likely eat more than the fatter ewes and therefore the scarce feed will be utilised quicker, but also they will gain more weight per MJ consumed.

Table 5: Priority of stock with respect to utilising high quality spring feed.

Priority	Class	Value of being 1 kg heavier (\$/kg LW)
1	At risk weaners	20
2	Ewes below CS 2.3 that wouldn't be mated	15
3	Ewes CS 2.5 mated to merino	2.90
4	Ewes CS 3 mated to merino Ewes CS 2.5 mated to terminals	2.40
5	Lambs being fattened for sale	2.00
6	Ewes CS2.5 mated to terminals	1.90
7	Ewes being fattened for sale	1.80
8	Not at risk weaners	0.40

Conclusions

At risk weaners are the highest priority animals however, because these animals only have a limited requirement for quality feed and over feeding has a very low value. Therefore, it is likely that the best approach will be to utilise supplementary feed that can be accurately allocated to this class and utilise green feed for the ewes. Feeding low condition score ewes so that they can reach mating weight is the highest priority. Segregating the flock to differentially feed these ewes will make the best use of sparse green feed.

Merino ewes mated to merino rams are a higher priority than merino ewes mated to terminal sires. There are 2 reasons, firstly the cross bred lamb is more robust than the merino lamb so feeding the

ewe to increase lamb birth weight shows a lower return in lamb survival. Secondly, in a restocking scenario the merino lambs are more valuable than the meat lambs that are sold for meat.

It is likely that older ewes (5yo +) will be a higher priority than younger ewes (3 & 4yo) because they are likely to be more sensitive to low condition. There is no data available on this, although monitoring does show that mortality rates of 6 yo and older ewes is much higher than young ewes, but this didn't measure the relationship with death rate and condition score.

Based on the data maiden ewes and mature ewes have a similar priority. However, maiden ewes have lower mothering skills than older ewes so extra condition on the maidens may increase lamb survival more than it does in the 3, 4 & 5 yo ewes. This would occur if the extra condition on the maidens results in the maiden ewe staying at the birth site for longer and having a greater impact than for an older ewe.

Fattening sale animals has a low priority, although the pay off depends on the price of store animals versus the finished animal. This is easier to estimate than some of the other calculations because the delay and hence price changes that can occur are less. However, if animals are retained for sale it is likely that utilising grain in a feedlot will be the better option than using paddock feed.

Maintenance vs LW Loss

Background

Sheep on pasture or in confinement will require large quantities of grain feed. Will it be cheaper to allow animals to lose weight and save on supplementary feeding. This analysis focuses on the extra feed required to achieve maintenance compared with allowing the ewes to lose weight. A low priority group from the previous analysis – ewes in CS 3 mated to a merino ram – have been used to illustrate the outcome. If it is profitable for this group fed on pasture it will be profitable for other groups fed either on pasture or in confinement.

Data / Assumptions

The assumptions are similar to the previous analysis except the comparison is between maintaining weight and losing weight, and the cost of the supplement required is also included. The rules of thumb for grain feeding levels have been used to calculate the increase in the quantity of grain required to achieve maintenance.

A comparison was done of feeding the ewes for maintenance between weaning and joining next year compared with allowing the ewes to lose 4kg of weight. During the period from weaning to joining a full grain ration for the ewes losing 4kg is about \$20/hd. Only the cost extra to this amount is included in the calculations.

Results

Table 6: Calculations that show feeding for maintenance is more profitable than allowing liveweight loss. Ewes starting at CS3 at weaning and losing 4 kg by next joining.

Income	Value per ewe
Increase scanning %	8%
4 kg * 2%/kg	
Increase BW	+110g/hd BW
LWJ + 4kg	
Increase lamb survival	
Singles +110g	+0.5%
Twins +110g	+3.7%

Increase weaning %	+7.0% @ \$100/lamb net	+\$7.00
Ewe Fleece value	+0.2kg, 0.34u broader	+\$0.70
Extra 0.051kg CFW / kg LW		
Increase 0.084u / kg LW		
Progeny Fleece value	+0.023kg, 0.014u broader	+\$1.00
Extra 0.051kg CFW / kg LW	Shorn 3 times	
Increase 0.084u / kg LW		
Ewe mortality	-0.6% mortality @ \$200/hd	+\$1.20
4kg heavier at lambing		
TOTAL INCOME		\$9.90
<u>Expenses</u>		
Grain feeding to reduce LWL	160MJ @ 2.5c/MJ	\$4.00
4kg LWL @ 40MJ/kg		
Grain to maintain heavier ewe	100MJ @ 2.5c/MJ	\$2.50
4kg heavier @ 25MJ/kg		
TOTAL COSTS		\$6.50
NET RETURN		\$3.40
Break even ration cost		3.8 c/MJ

The increase in income achieved is split between wool and meat. For a merino operation the split varies between 60:40 and 50:50 and approximately 30% is received within the next 12 months and the remainder spread over a longer period. For a merino-terminal sire operation the wool-meat split is 25:75 and most of the income is received within the next 12 months. Feeding ewes mated to a terminal is a lower priority however, the pay-off is more immediate than in a wool system.

Conclusions

Feeding for maintenance is more profitable than allowing LW loss. For a ewe in CS3 feeding for maintenance requires feeding an extra \$6.50 of feed on top of the \$20 that would have been fed over that period if LW was to fall by 4kg. Feeding the extra \$6.50 of ration increases profit by \$3.40, providing 50% return on the extra ration fed. This calculation is for a low priority animal class (ewes in CS3) and indicates that if ewes are retained on farm that feeding sufficient grain to maintain weight is a good investment and the return will be higher for higher priority sheep classes.

Feeding Grain to gain weight

Background

Feeding ewes to maintain weight is highly profitable in the current market conditions, is it profitable to feed extra and gain weight.

If ewes are being confinement fed then it requires less increase in the feeding rate to achieve liveweight gain, therefore it is more likely to be profitable to feed ewes for LW gain if they are already being fed in confinement.

Data / Assumptions

A comparison was done of feeding ewes that are currently CS 2.6 to gain 4kg between weaning and joining next year compared with maintaining the ewes.

The difference in income is the same as in the previous example because the comparison is between a ewe that is 4 kg different at joining

Results

Table 7: Profitability of feeding to gain weight in confinement or at pasture. Ewe starting at CS2.6 at weaning and being fed to gain 4kg by next joining.

<u>Income</u>		Value per ewe
TOTAL INCOME		\$9.90
<u>Expenses fed in confinement</u>		
Grain feeding to achieve LWG 4kg LWG @ 50MJ/kg	200MJ @ 2.5c/MJ	\$5.00
Grain to maintain heavier ewe 4kg heavier @ 28MJ/d	112MJ @ 2.5c/MJ	\$2.80
TOTAL COSTS		\$7.80
NET RETURN fed in confinement		\$2.10
Breakeven ration cost		3.2 c/MJ
<u>Expenses fed at pasture</u>		
Grain feeding to achieve LWG 4kg LWG @ 100MJ/kg	400MJ @ 2.5c/MJ	\$10.00
Grain to maintain heavier ewe 4kg heavier @ 30MJ/d	120MJ @ 2.5c/MJ	\$3.00
TOTAL COSTS		\$13.00
NET RETURN fed at pasture		-\$3.10
Breakeven ration cost		1.9 c/MJ

Conclusions

If ewes are in confinement, then it is mostly profitable to feed them to gain weight. The return on the extra feed is less than when feeding for maintenance but is still high with a return of 75% on the extra feed.

When feeding on pasture it is less profitable and only ewes that were identified as high priorities (value of LWG > \$2.90/kg) will be profitable.

Therefore, if feeding ewes in confinement higher rations can be fed and profit will be increased. This occurs even for flocks that have a low response in scanning percentage for an increase in LW at joining. If the flock only responds at 10 extra foetuses conceived per CS the value of the extra feeding is reduced from over \$3/ewe to just under \$2/ewe and the return on investment is 30%. This result may be relevant north of Perth because in LifetimeWool some low response flocks were measured in that area.

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