Live export analysis

Youngs Farm Analysis 2023

Aim of initial analysis

Quantify the impact of the cessation of the live export market for farmer that are running 100% Merino sheep, lambing in July and selling weathers into the export market.

Introduction

There are a range of livestock markets consisting of three key lamb markets: prime lamb, air freight and store lamb. Sheep over 12 months of age receive a discount. Under usual market conditions the prime lamb market is the most valuable of the three. Mutton and live export are alternative sheep markets common for older sheep. The export market also provides relatively good prices for light (35kg) wethers. In the past the export market has generally delivered 25%-30% higher prices than mutton.

Young et al (2020) showed that targeting the prime lamb market is most profitable flock structure for merino flocks in Great Southern WA however it required high levels of supplementary feeding (potentially increasing risk) and it is a high production sheep system requiring a significant level of management.

Although the prime lamb market has been indicated as the most profitable option there are a host of reasons why some farmers target other markets. For example, farmers frequently target the export market because it an easy avenue for farmers to sell weathers. This can suit farmers who are wool focused or farmers who a crop focused and don't have high production lamb systems. Furthermore, in poor weather-years the export market can provide a good safe haven to offload sheep.

Important aspects of removing export market include:

1. There are other market options for farmer who target live export. However, remaining profitable in a new market will likely require adopting new or adjusted management practices.
2. Local market price changes due to supply changes. If the export market is removed and everyone switches to lamb production market prices may drop. The air freight lamb price may remain more stable due to the international scope where Australia is only a small player.
3. Shift in on-farm risk due to the removal of the export market safe haven.

Method

Modelling

A model called **A**ustralian **F**arm **O**ptimisation Model (AFO) has been selected as the appropriate tool to evaluate the on-farm impacts of cessation of live export because it has detailed feed budgeting modules that accurately accounts for the utilisation of feed sources across the whole farm feed throughout the whole year for different flock structures and management practices. Additionally, AFO includes year-to-year climate variation allowing the economic risks associated with market

change to be understood and evaluated. Furthermore, the advanced optimisation algorithm encompassed in AFO allows the optimum on-farm management adjustments in response to market change to be identified.

AFO is a whole farm linear programming model that supersedes the popular MIDAS model (Bathgate et al., 2009, Kingwell, 2011, Kingwell and Pannell, 1987, Kopke et al., 2008, Pannell, 1996, Thamo et al., 2013, Young et al., 2011, Young et al., 2020). The model represents the economic and biological details of a farming system including modules for rotations, crops, pastures, sheep, crop residue, supplementary feeding, machinery, labour and finance. Furthermore, it includes land heterogeneity by considering enterprise rotations on any number of soil classes. A brief summary of the model has been provided however, for a more thorough description see the model documentation: https://australian-farm-optimising-model.readthedocs.io/en/latest/index.html.

Calibration

Table 1: Summary.

Metric	value
Region	Kojonup/Darkan region
Time of lambing	July
Scanning management	Wet and dry
Genetics	Medium wool merino (SWR=55)
Weaning %	82-89
Wether CFW (kg/hd)	3.6
Wether FD (u)	20

Table 2: Grid price for an in-spec animal.

Grid	Saleyard price
Prime Lamb grid ($/kg cwt)	5.98
Air freight lamb grid ($/kg cwt)	5.38
Store lamb grid ($/kg cwt)	4.24
Export wether grid ($/hd)	111.73
Mutton grid ($/kg cwt)	4.09

Table 3: Wool prices

FD	Flc Price (c/kg clean)	STB NIB greasy
16	2107	1290
17	1854	1138
18	1685	1032
19	1559	952
20	1432	877
21	1404	855
22	1376	837
24	1250	761
26	871	535
28	653	402
32	461	281
34	423	256
38	346	209

Table 4: Rotation. Note this is held constant for all flock structures.

Rotation	Deep sand	Gravelly sand	Loamy sand
Cont Pasture	75		
Pasture-Barley	75	830	690
5 years Pasture-Canola-Wheat-Barley		400	60

Results

Flock comparison

- Hitting optimal wether live weight targets is a significant profit driver for flocks retaining wethers over the summer/autumn period.
- Hitting liveweight targets is most important for a heavy lamb producing farmer because if targets are missed (particularly fat score) sale value can be significantly reduced (Figure 1).
- If farmers are hitting live weight targets shifting away from live export market can be profitable. However, even if targets are not being met other market structures such as mutton or light lamb can utilised without major profit impacts.
- Older mutton is less profitable because retaining wethers reduces ewe carrying capcity. And the sheep reach their mature weight so holding for long doesn't significantly increase sale value.
- Optimised is the potential profit.
- Shipper market is a good fall back for prime lamb producers because if they miss their targets they can sell in export market

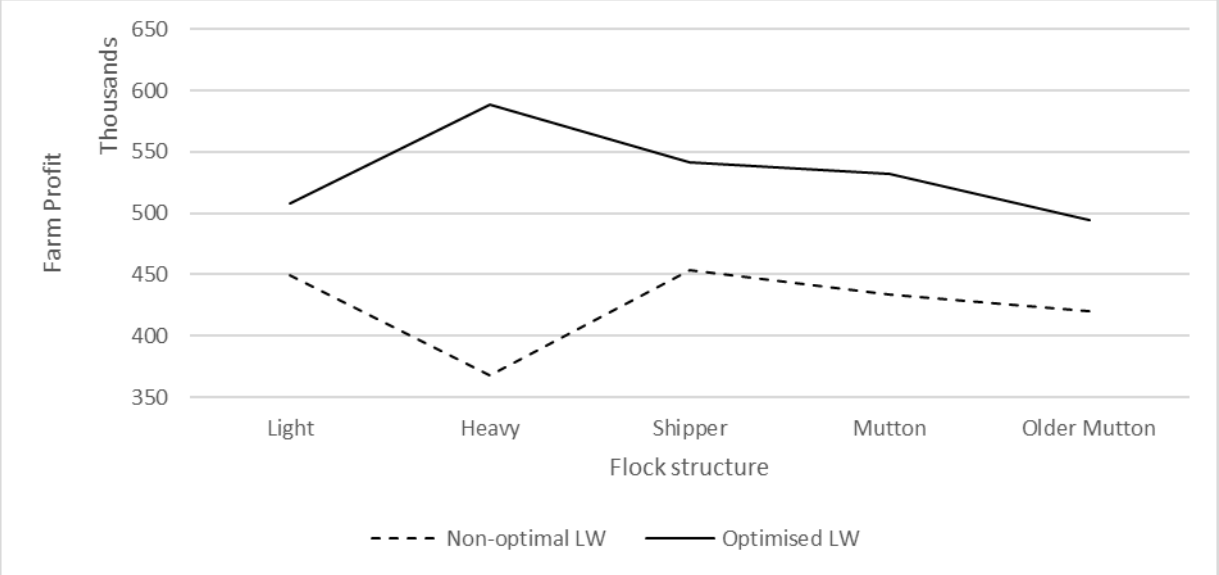


Figure 1: Farm profit for different flock structures with optimal and non-optimal animal live weight profiles.

Table 5: Result summary with non-optimal liveweight – see attached excel workbook for further details.

	Stock GM ($/WgHa)	Wool Income ($/WgHa)	Trade Income ($/WgHa)	Feed cost ($/WgHa)	Stocking rate (DSE/Ha)

Light lamb	$198	$535	$315	$133	13.0
Heavy lamb	$126	$520	$238	$130	12.6
Shipper	$200	$571	$274	$144	13.5
Mutton	$181	$561	$249	$144	13.1
Older Mutton	$169	$559	$243	$160	12.8
MTS	-	-	-	-	-

*Values are the average across all the weather-years.

Table 6: Result summary with optimal live weight– see attached excel workbook for further details.

	Stock GM ($/WgHa)	Wool Income ($/WgHa)	Trade Income ($/WgHa)	Feed cost ($/WgHa)	Stocking rate (DSE/Ha)
Light lamb	$250	$550	$353	$139	13.3
Heavy lamb	$334	$622	$528	$258	12.8
Shipper	$275	$587	$340	$152	13.7
Mutton	$268	$588	$346	$165	13.1
Older Mutton	$229	$568	$251	$122	12.5
MTS	$361	$554	$566	$219	12.8

*Values are the average across all the weather-years.

Live weight profile and sale timing

Note the salve values are mob averages after sale costs.

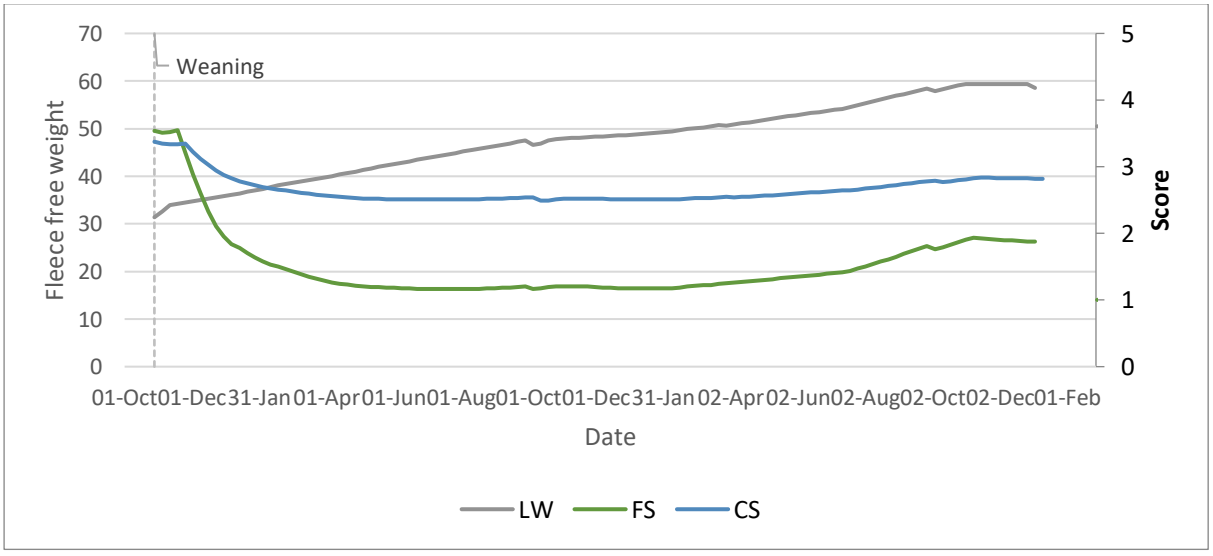


Figure 2: Ashley's predicted wether live weight profile and the corresponding condition score (CS) and fat score (FS).

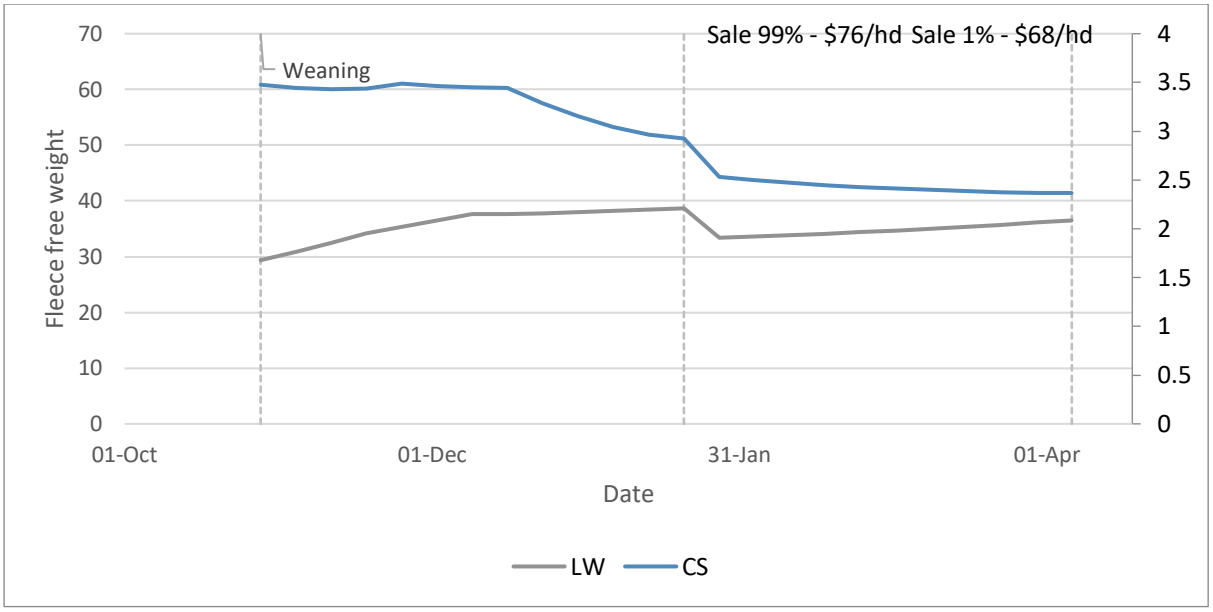


Figure 3: Optimised wether live weight profile for light lamb markets (store & air freight) and the corresponding condition score (CS) and fat score (FS).

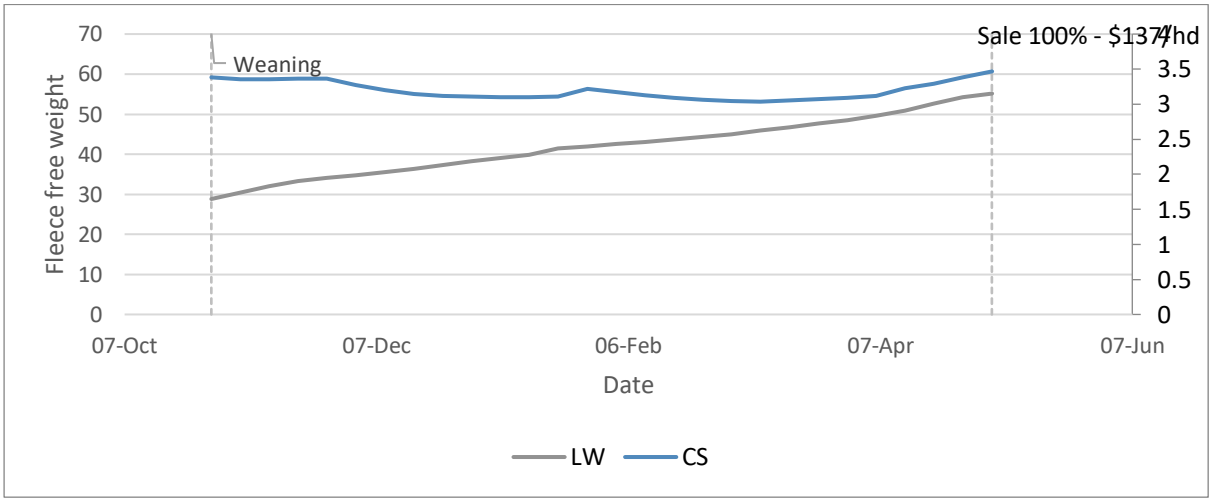


Figure 4: Optimised wether live weight profile for heavy lamb market and the corresponding condition score (CS) and fat score (FS).

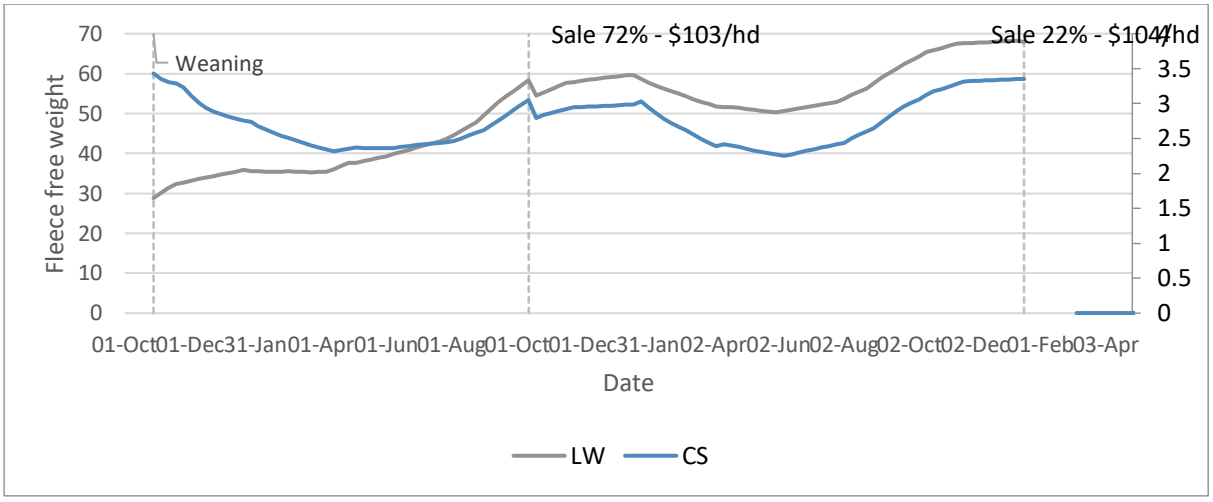


Figure 5: Optimised wether live weight profile for export market and the corresponding condition score (CS) and fat score (FS).

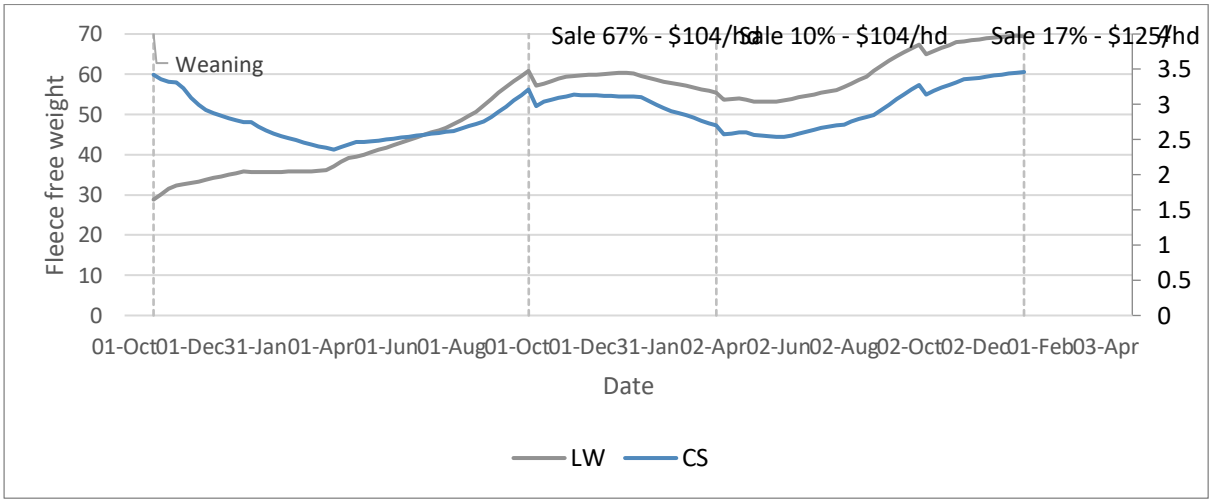


Figure 6: Optimised wether live weight profile for mutton market and the corresponding condition score (CS) and fat score (FS).

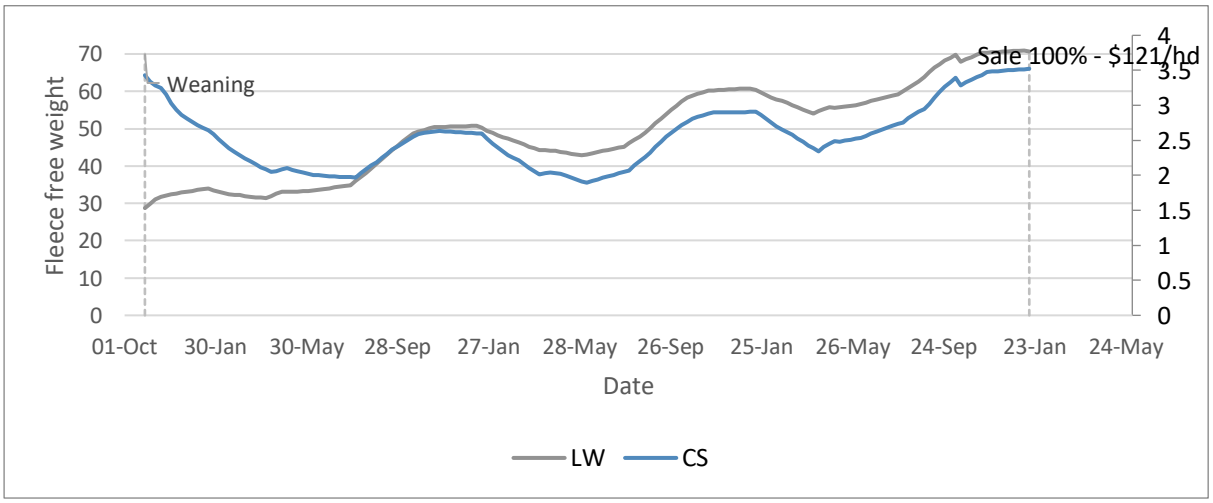


Figure 7: Optimised wether live weight profile for older mutton market and the corresponding condition score (CS) and fat score (FS).

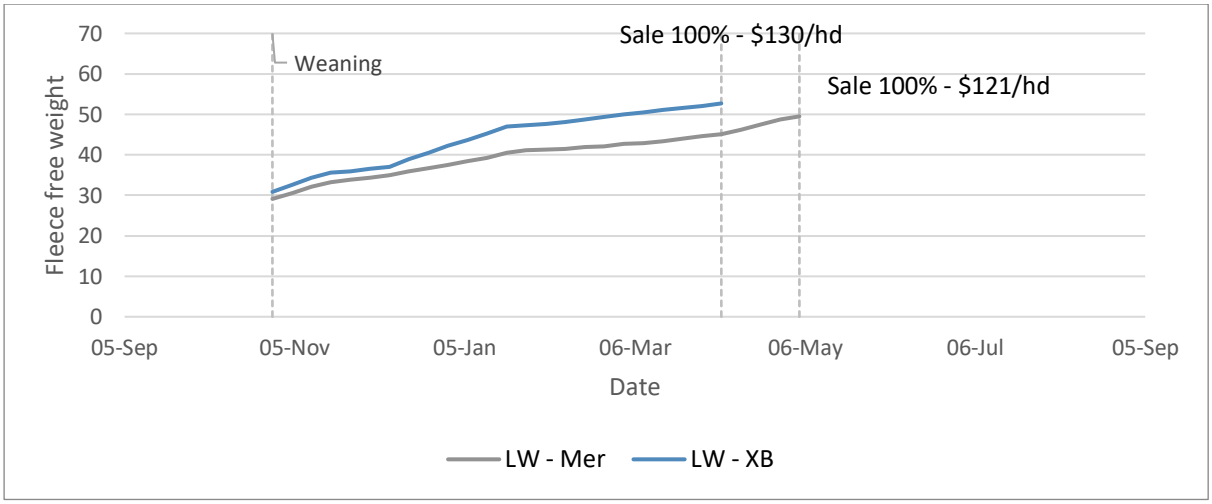


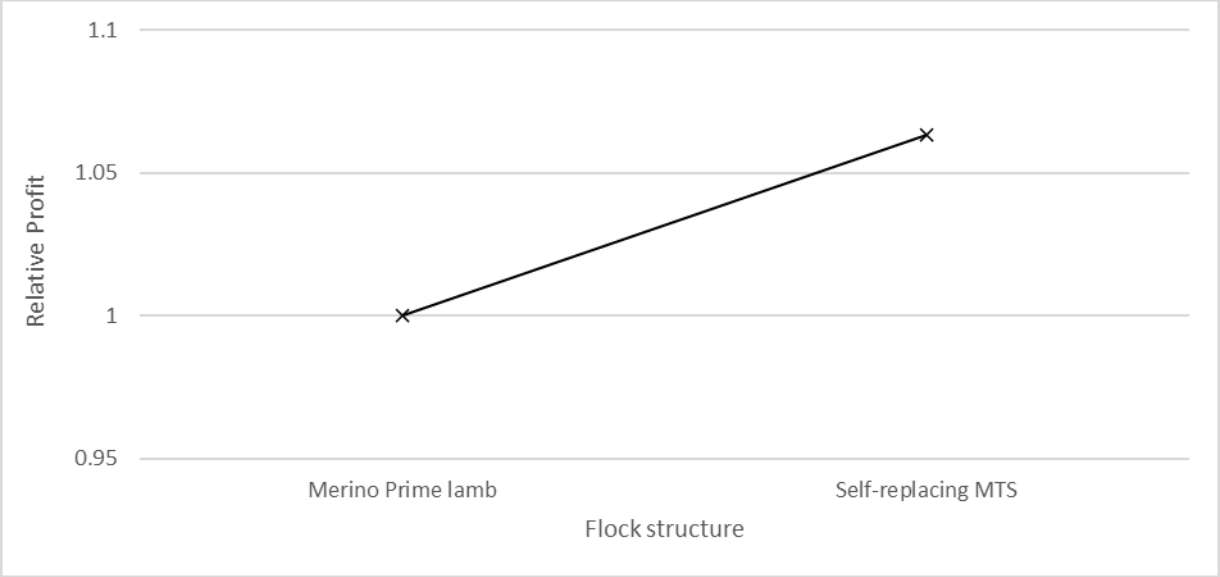
Figure 8: Optimised wether live weight profile for MTS market and the corresponding condition score (CS) and fat score (FS).

Sale age of heavy lamb

- In the base case it is optimal to hold onto heavy lambs until just before they cut their teeth (15 month of age). However, in reality farmers rarely do this because it is risky (i.e. it is not certain exactly when lambs will cut teeth, trucks may be late, etc). Therefore, we have tested a scenario where lambs must be sold prior to 13 months of age.
- If LW profile remains the same, then profit drops 100k because miss spec. However, if LW is optimised then sale at 13 mo of age has little (<5k) effect on profit.

Self-replacing merino flock mating surplus ewes to terminal sires

- Merino terminal sire flock is 6% more profitable than a 100% merino flock when selling prime lambs.
- XB wethers are sold at younger at ~8 months of age.
- XB wethers are sold at ~ 51kg lw.
- Similar level of supplementary feed is required for both flocks.
- Costs (supplement/husbandry/labour) are down 70k, Wool income is down 80k and meat income is up 43k.
- Increased weaning % due to paternal genetics and fatter ewes.



Stocking rate sensitivity

- This study's results indicated that altering the stocking rate away from the optimum reduced farm profit. However, most importantly, the relative profitability between the different flock structures was not altered.
- Optimal animal live weight profile remains similar at both stocking rate levels. This is because even at the higher optimal stocking rate it is optimal to feed sheep well.
- At a 25% lower stocking rate supplementary feed is reduced by 50%.

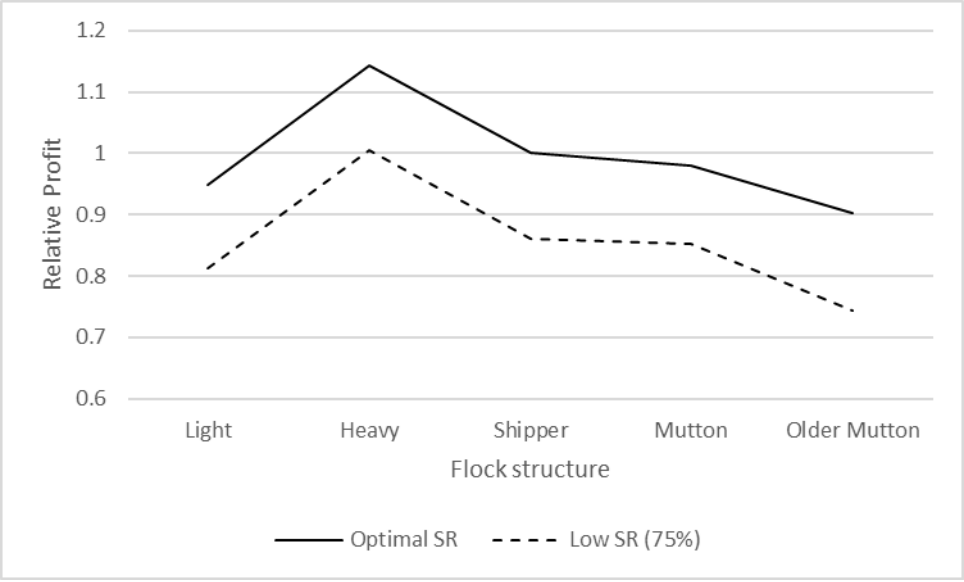


Figure 9: Farm profit for each flock structure with optimal and low (75%) stocking rate.

Price Sensitivity

- Relative flock profit remains similar for 25% meat price fluctuations suggesting that the choice of flock structure is robust to changes in meat price. Although at low meat prices the relative benefit of the prime lamb flock reduces due to it meat focus.
- Relative flock profit remains similar for 25% wool price fluctuations suggesting that the choice of flock structure is robust to changes in wool price.

- For a composite flock with more of a meat focus the relative prices may change more.
- 25% meat price drop reduces farm profit by ~20%

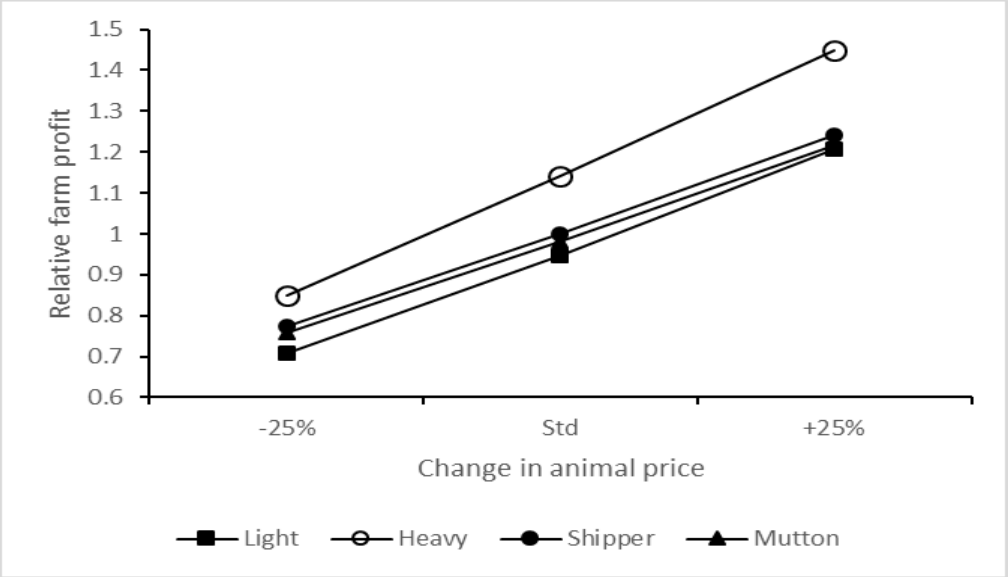


Figure 10: Farm profit for each flock structure relative to the shipper flock (i.e. whole-farm profit of a given flock divided by whole-farm profit of the shipper flock), when the meat price was altered (25 per cent, unchanged, +25 per cent).

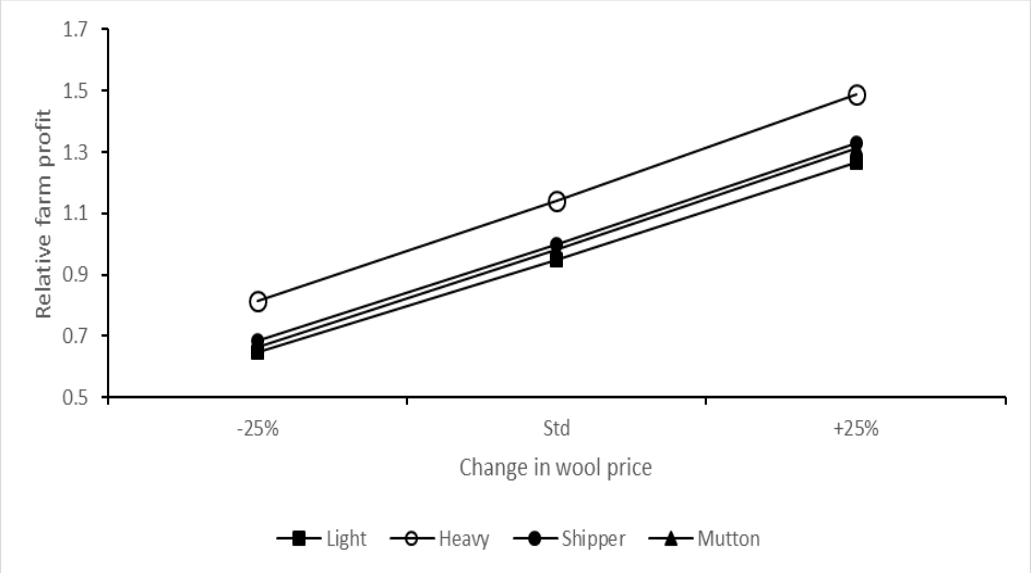


Figure 11: Farm profit for each flock structure relative to the shipper flock (i.e. whole-farm profit of a given flock divided by whole-farm profit of the shipper flock), when the wool price was altered (25 per cent, unchanged, +25 per cent).

Caveats:

1. There is an aspect of management ease of running shippers compared to prime lambs that is not being represented in AFO (note labour differences are included). The meaning of this is that if the export market is to cease the industry will need to invest in upskilling farmers.