Genetic Evaluation:
Productivity, Efficiency and Profitability

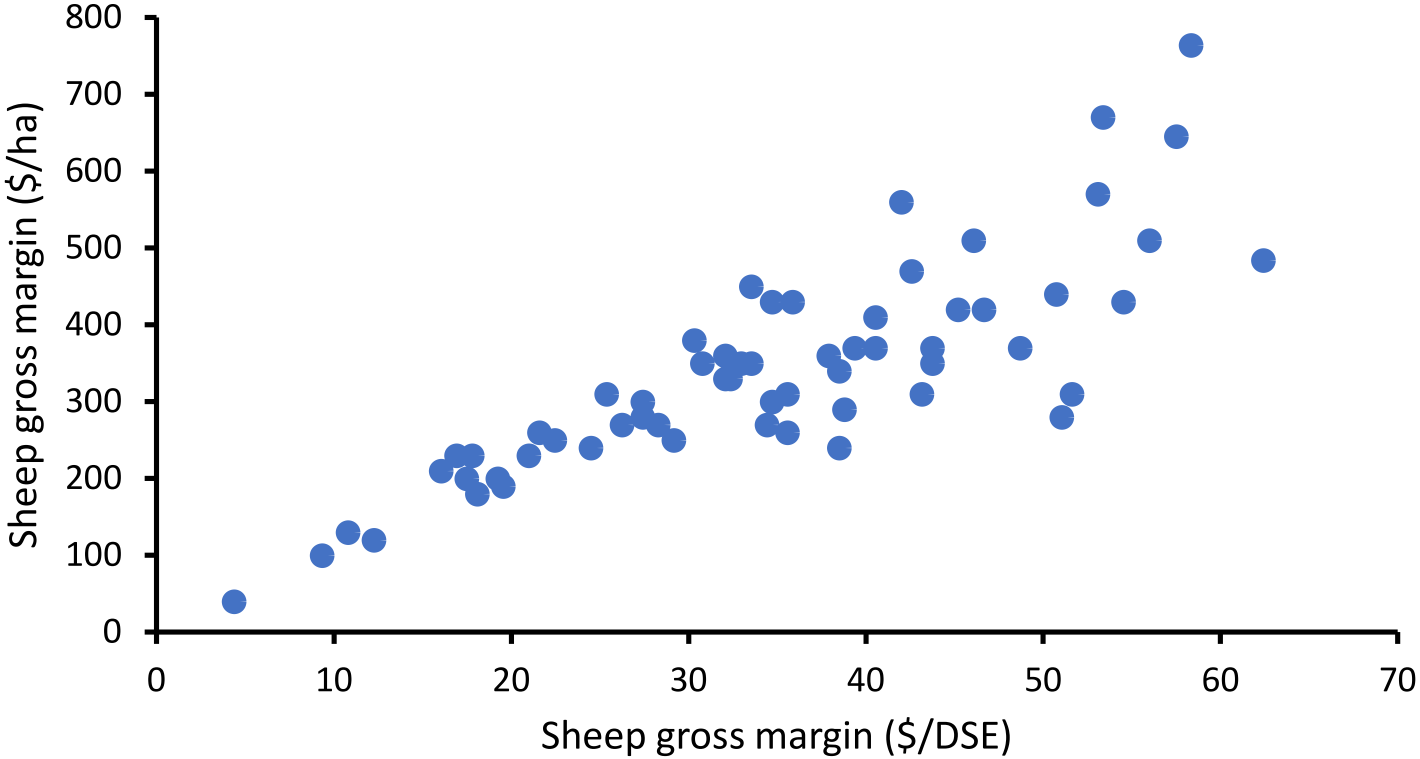
Colin Byrne, Sarah Blumer and Andrew Thompson

Murdoch University
Australian Wool Innovation Limited
Department of Primary Industries and Regional Development
GOVERNMENT OF WESTERN AUSTRALIA

What I am going to talk about

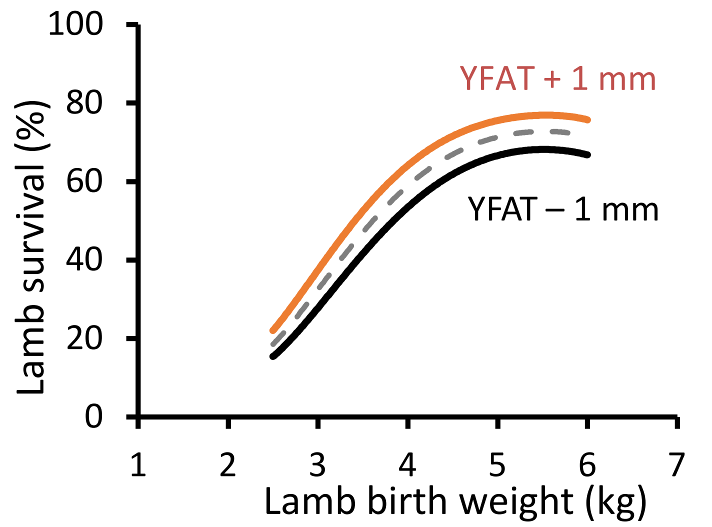
- Value of fat
- Fat and feed/liveweight efficiency in adults
- Fat and whole farm economics
- Where to next?!

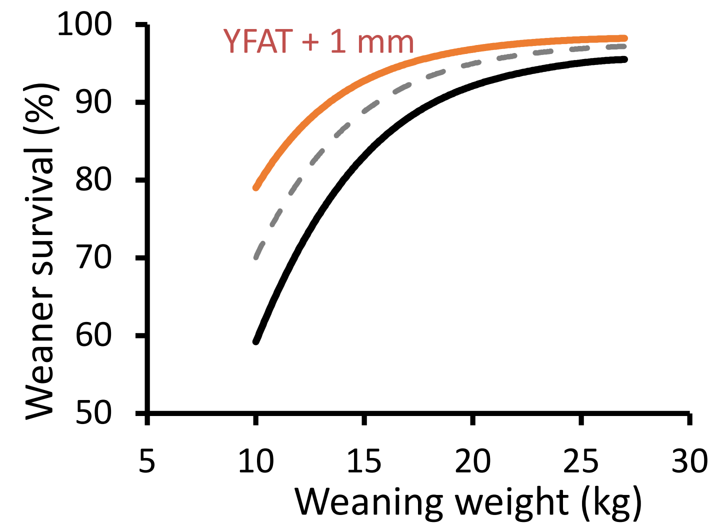
Reward for effort



Value of fat

- Well demonstrated
  - *Condition score at joining increases conception (20% per CS)*
  - *Higher lambing (5% per mm YFAT but ranges)*
  - *Maintain lamb birth weights under poor nutrition*
  - *Higher lambing % from ewe lambs (3.2% per mm YFAT)*
  - *Sire YFAT delivers higher lamb survival at the same birthweight*
  - *Sire YFAT delivers higher weaner survival at the same weaning weight*





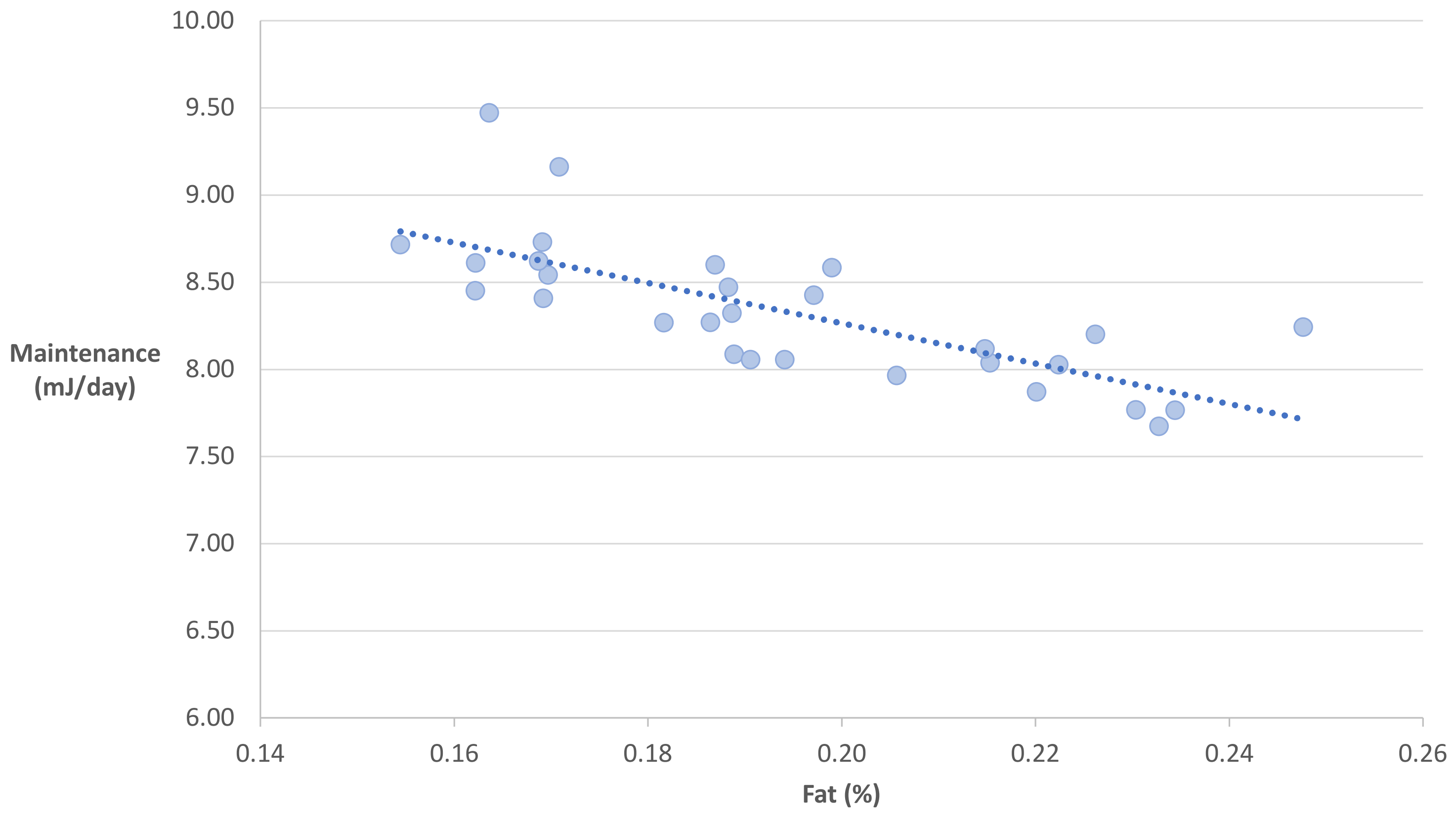
Feed and liveweight efficiency

- Number of component traits
  - *Liveweight and composition*
  - *Maintenance requirements*
  - *Potential intake*
  - *Energy value of gain*

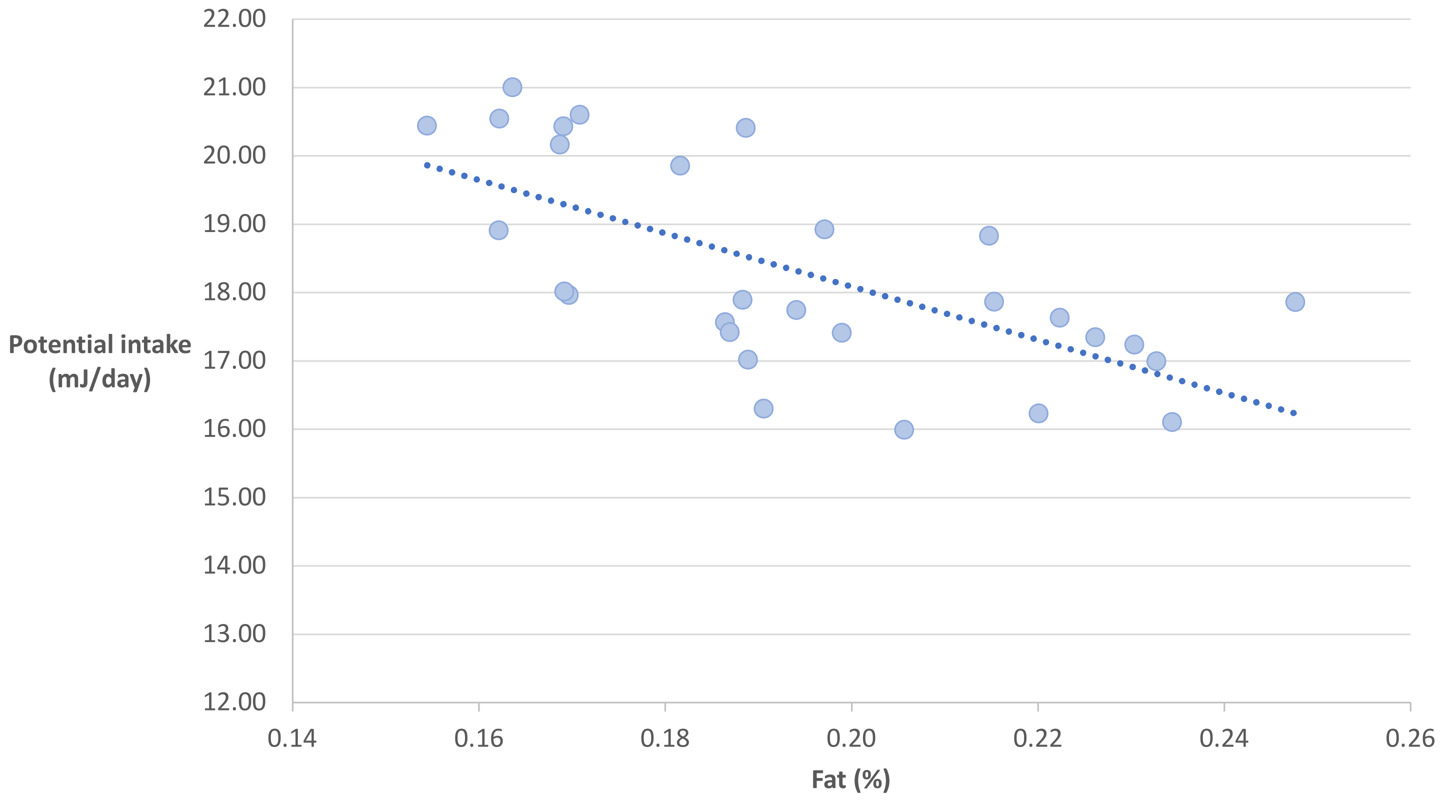
Feed and liveweight efficiency

- Number of component traits
  - *Liveweight and composition*
  - ***Maintenance requirements***
  - ***Potential intake***
  - *Energy value of gain*

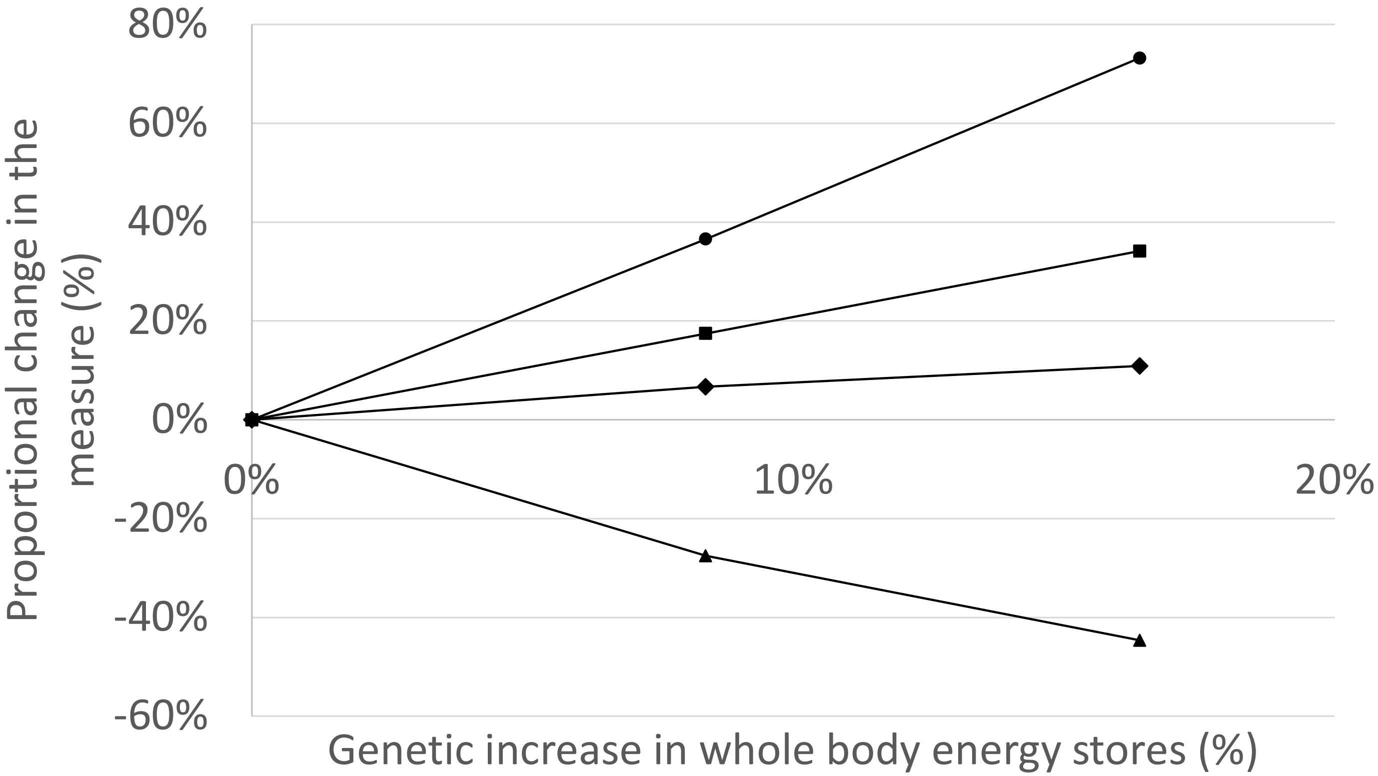
Maintenance



Potential intake

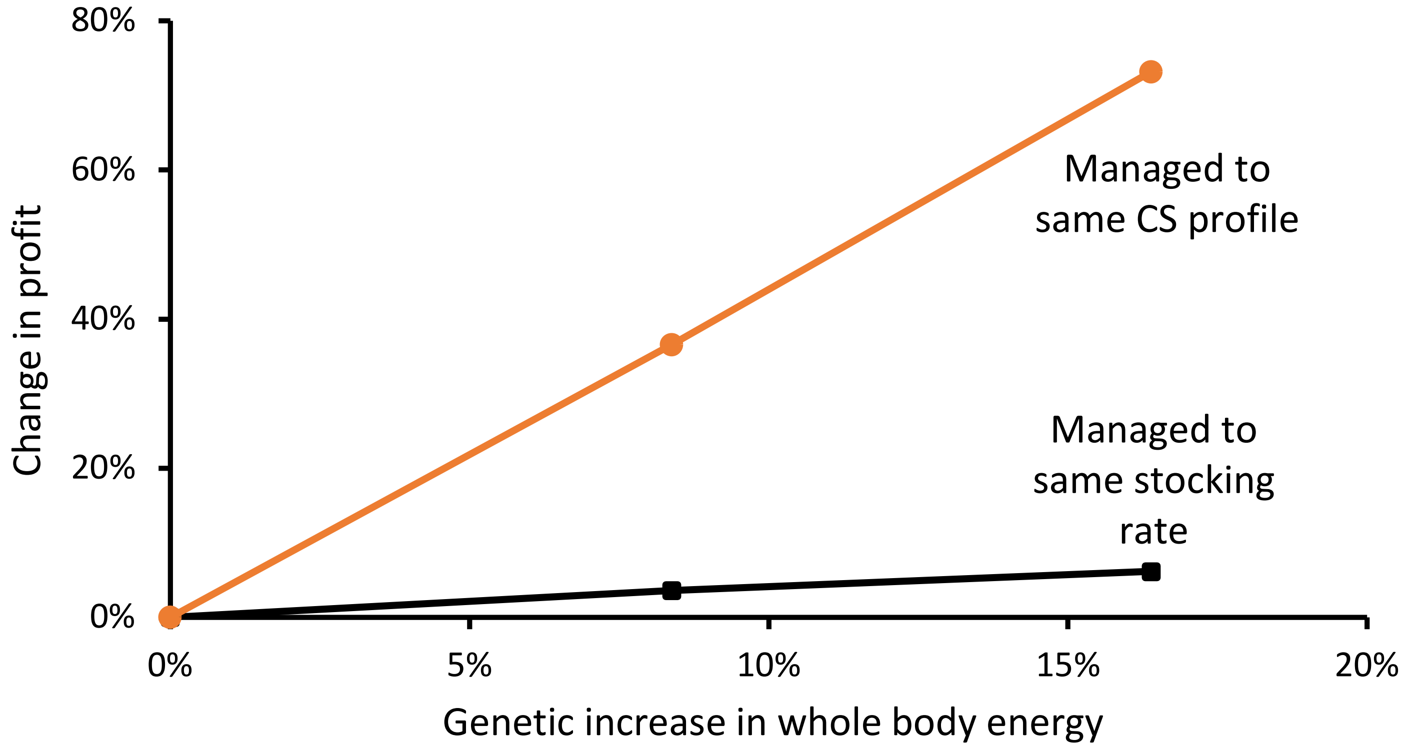


Whole farm modelling

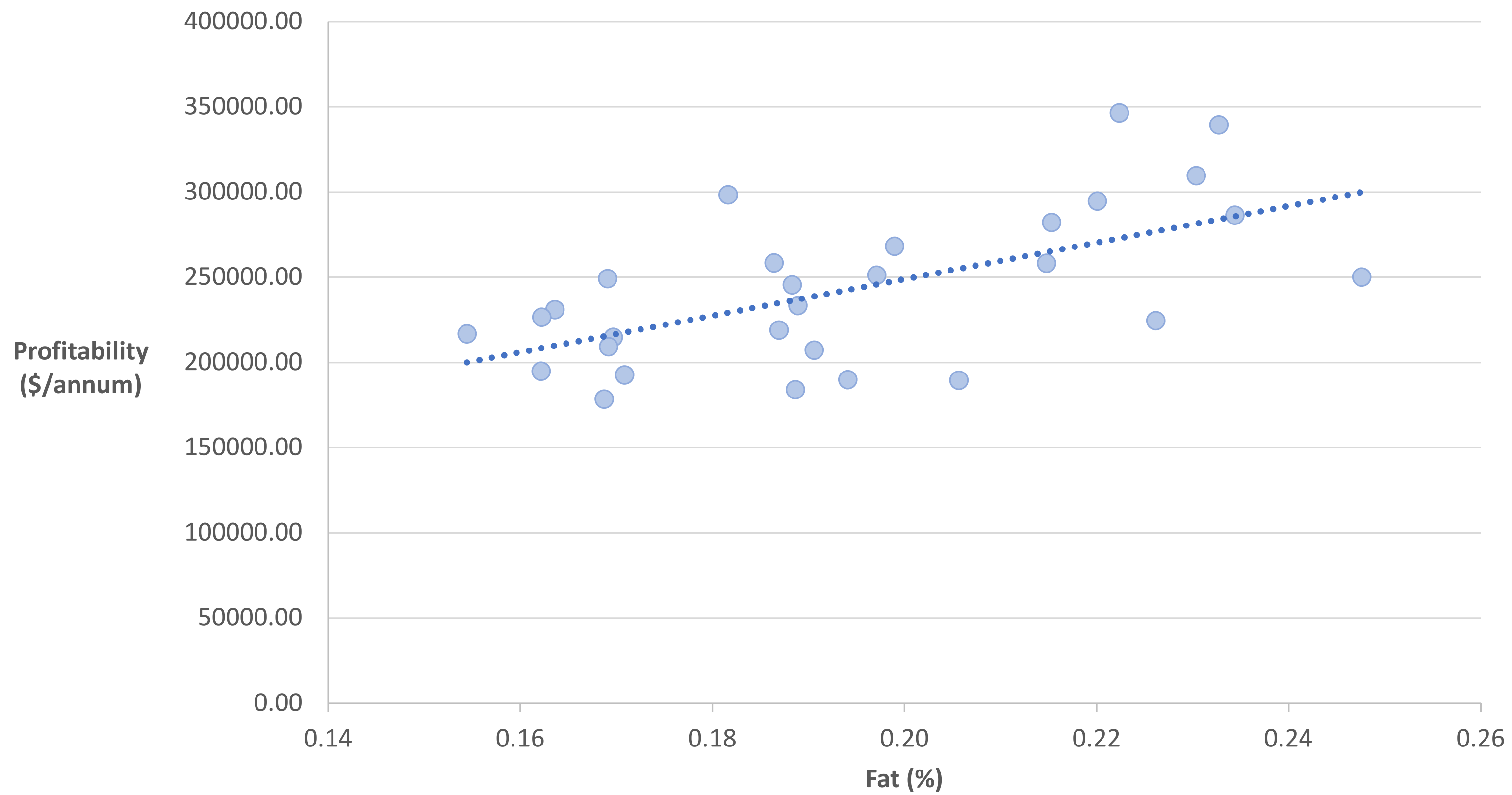


- Profit
- Stocking rate
- Pasture utilisation
- Supplementary feeding

Sub-optimal management



What does GEPEP say?



Hear more about these results!

Pingelly MLP Field Day

– Check back for more details closer to time –

MLP

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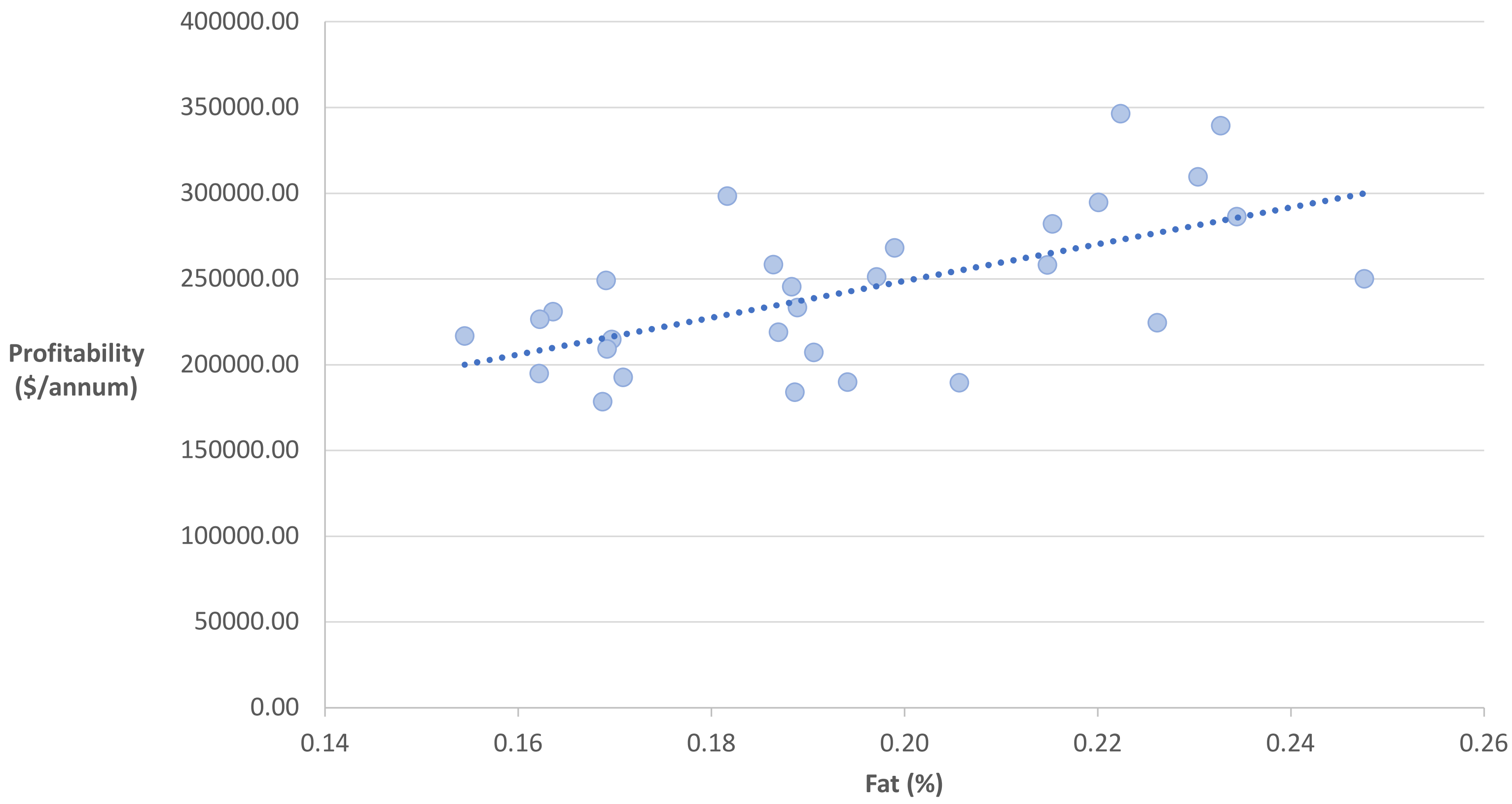
What does GEPEP say?



Making More from Maidens

Tom Clune and Caroline Jacobson

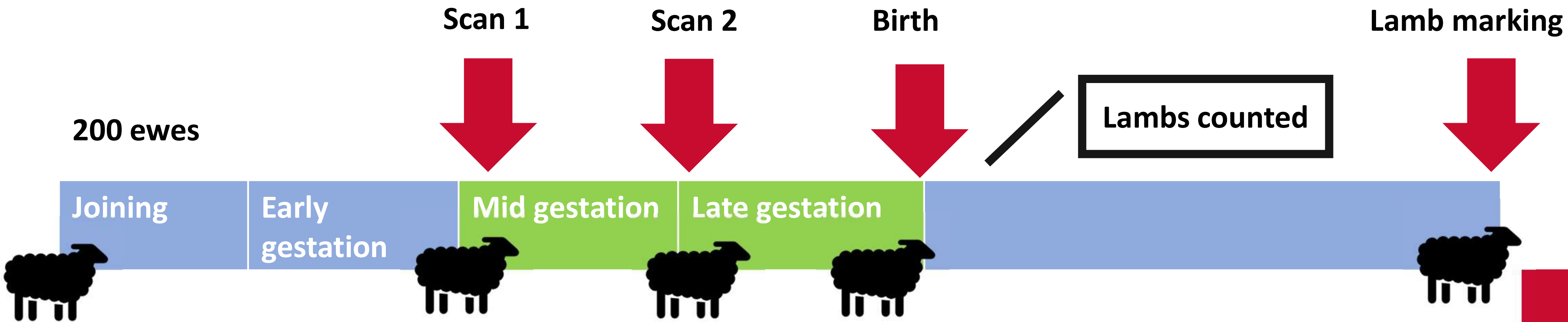
Introduction

- Improving maiden ewe performance – high priority
- Maiden reproduction inconsistent & often disappointing
- Is abortion an important contributor to overall reproductive wastage in maiden ewes?
- Are infectious diseases important contributors?

Research Design

30 flocks on 28 farms from WA, SA, VIC

- 19 ewe lamb flocks
- 11 Merino hogget flocks



Overall loss scanning to marking – “survival”

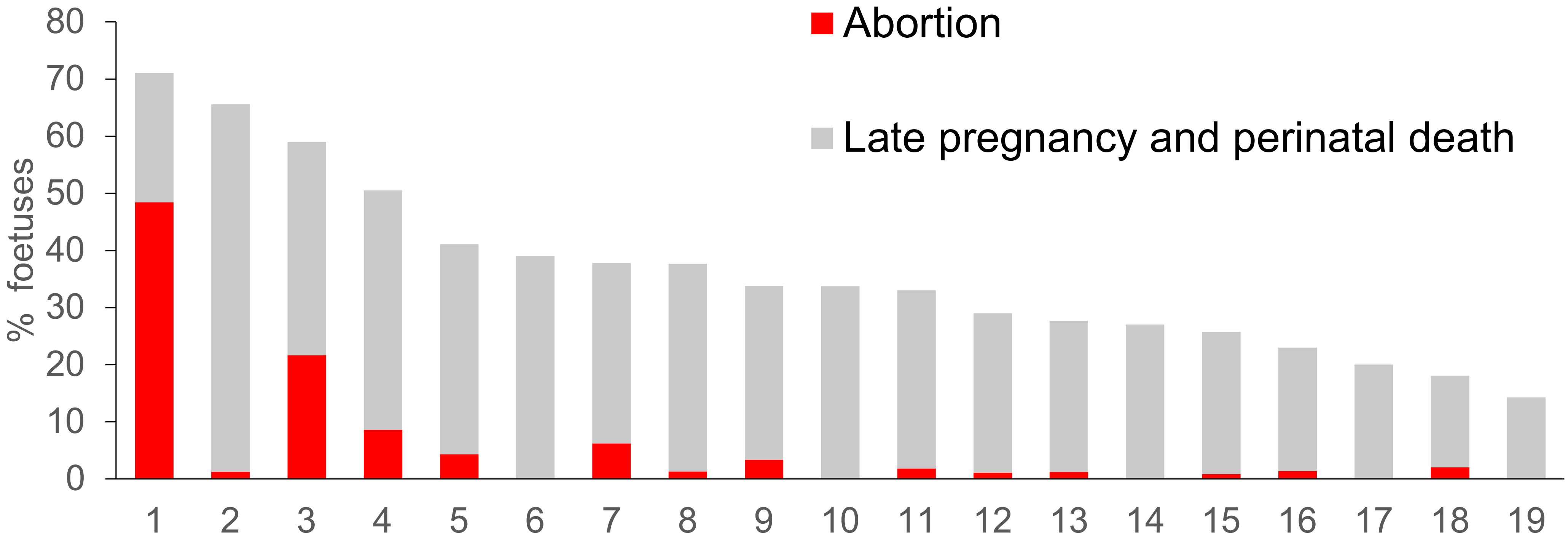
Scan 1

Lamb marking

Joining	Early pregnancy	Mid pregnancy	Late pregnancy	Perinatal period	

	Average wastage	Low	High
Ewe lambs	36% foetuses	14%	71%
Hoggets	29% foetuses	20%	53%

Ewe lambs



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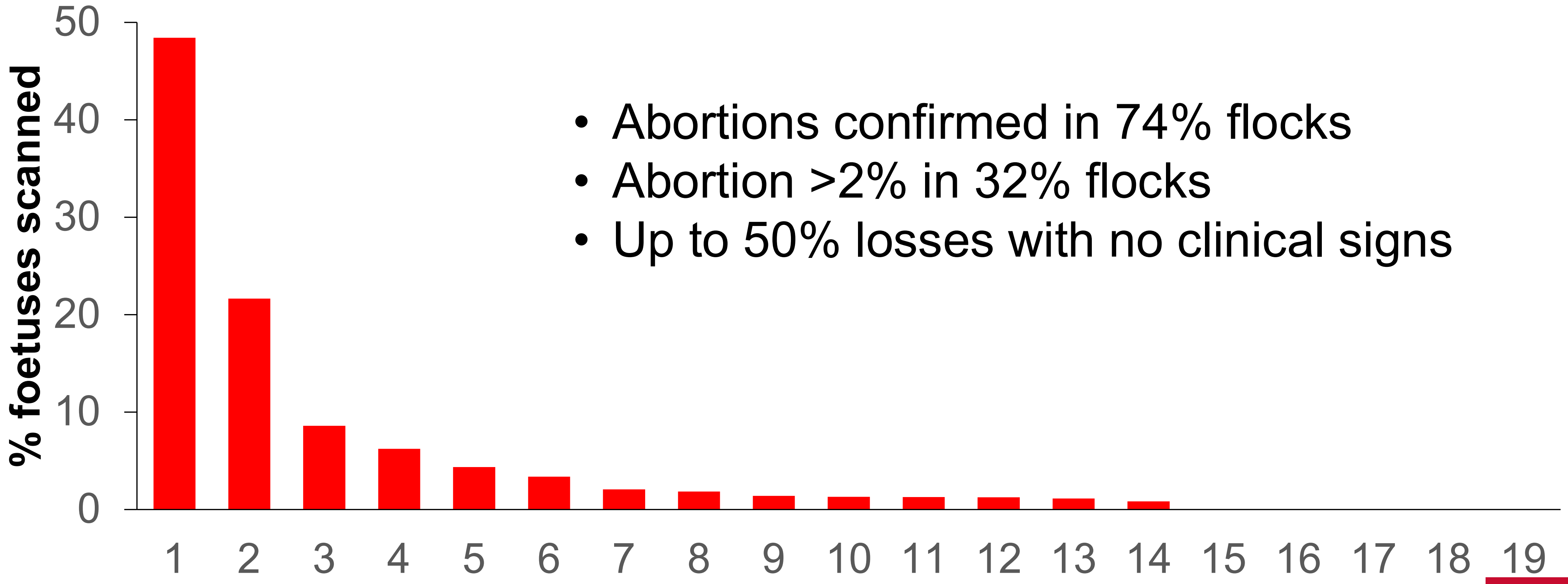
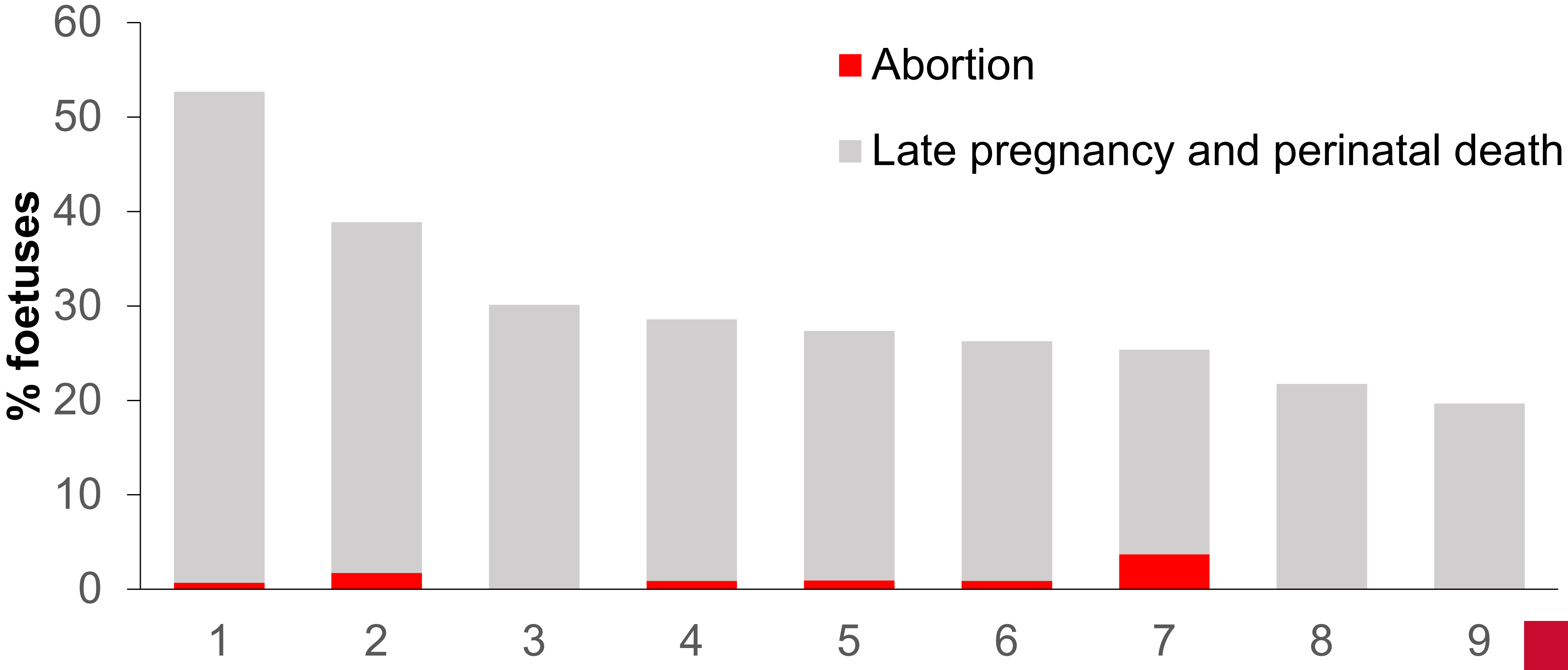
Abortions in ewe lambs



- Abortions confirmed in 74% flocks
- Abortion >2% in 32% flocks
- Up to 50% losses with no clinical signs

Hoggets



60
50
40
30
20
10
0
% foetuses
Abortion
Late pregnancy and perinatal death
1
2
3
4
5
6
7
8
9

Disease screening

	Seroprevalence
Toxoplasma	1.1%
Neospora	0.2%
Q-fever	0.1%

Not a major cause of abortions and perinatal lamb deaths

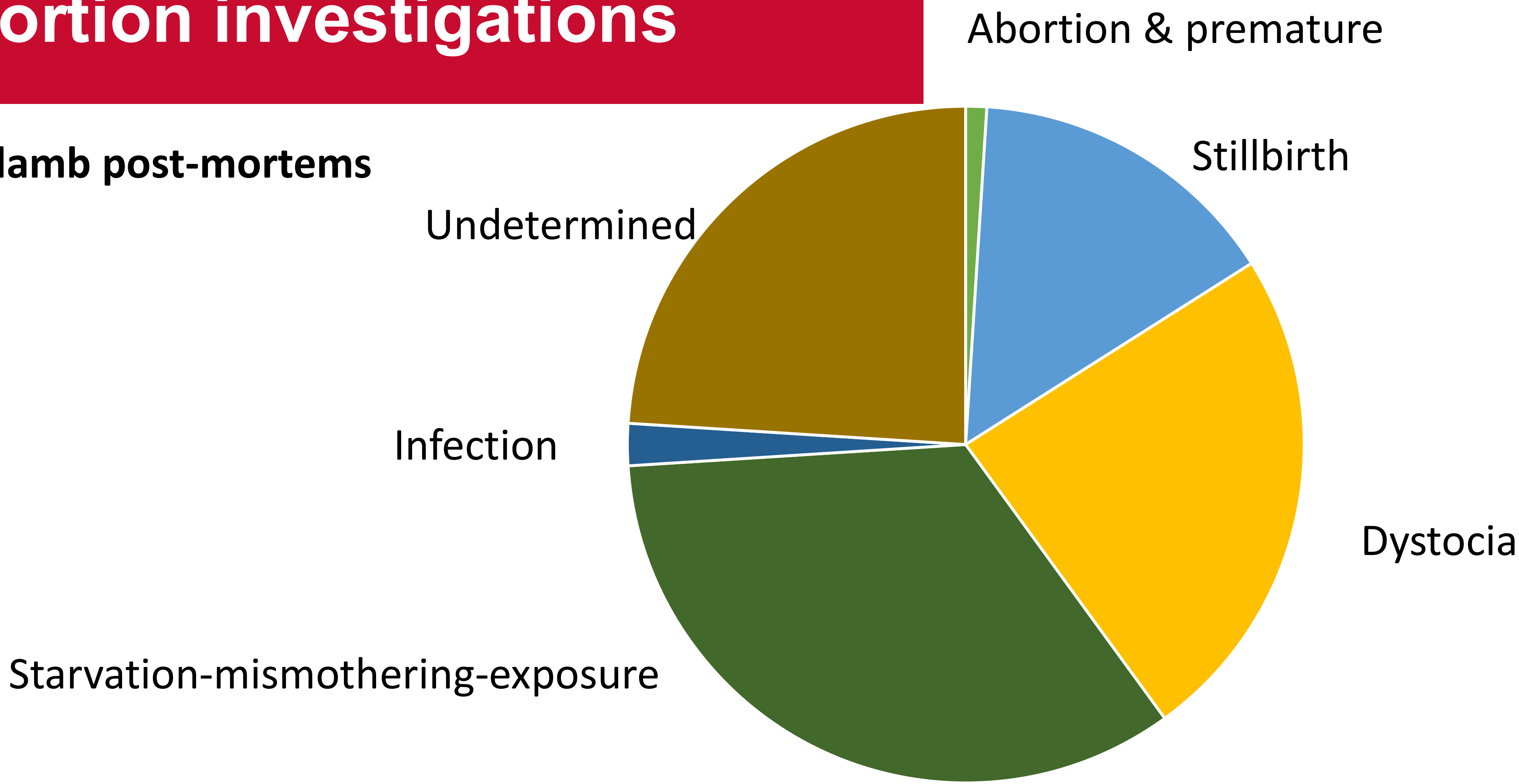
Serology – *Campylobacter*

	Antibody level above threshold	
	C. fetus	*C. jejuni*
Abortion/fail to rear	**14%**	**40%**
Raised all lambs	10%	49%
Statistical difference	not sig	yes

Flock-level seroprevalence a poor predictor of reproductive outcome

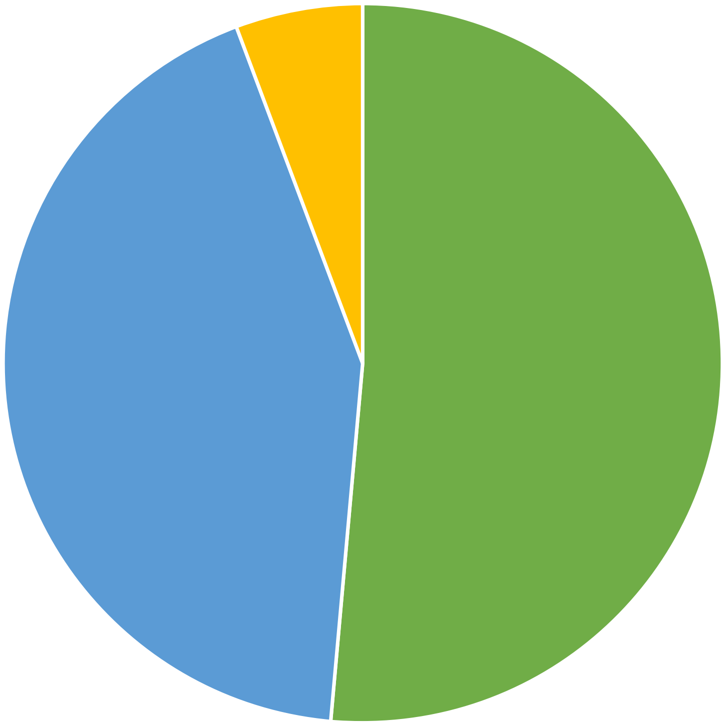
Abortion investigations

298 lamb post-mortems



Abortion investigations

35 aborted or stillborn lambs



Chlamydia

43% lambs

Detected on 5/6 farms

Summary

Are foetal losses during pregnancy an important contributor to overall reproductive wastage in maiden ewes?
Yes for ewe lambs on about 1 in 3 farms, however perinatal lamb losses were the major source of lamb loss

Are endemic diseases important contributor?
Chlamydia pecorum
Sporadic – *Campylobacter*

Take home messages

- Perinatal losses= most important source of lamb deaths
- Ewe nutrition, paddock selection, mob size are important
- Abortions occur without overt/obvious signs of abortion storm
- Consider repeat scanning to investigate
- Submit tissues from any abortions (don’t wait and see)
- Lamb post mortems and lab investigation for stillborn lambs

Acknowledgements & disclosures

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SIBI Postgraduate Award

Partners

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KANGAROO ISLAND Veterinary Clinic

millicent veterinary clinic

Willunga Veterinary Services

Aldinga Veterinary Services

Livestock Logic

Vet & Ag Consultants | Parasite & Feed Analysis

Mob size at lambing – what is optimum and what are the economic benefits of lambing ewes in smaller mobs?

Dr Amy Lockwood

Lambing ewes in smaller mobs improves lamb survival

- On average, lamb survival increases by 0.85% for singles and 2.2% for twins when mob size at lambing is reduced by 100 ewes (Lockwood *et al* 2019; 2020; Hancock *et al* 2019)

- Effect consistent regardless of ewes stocking rate and breed

- Additional strategy for improving lamb survival

Putting it into practice

- Subdivision - temporary vs permanent fencing?
- Reallocation of ewes within existing paddocks?
- What are the $ benefits?

Factors influencing optimum mob size

Most sensitive to;

- Single vs twin
- Costs of subdivision
- Improved pasture utilisation?
- Target return on investment

Less sensitive to;

- Stocking rate
- Breed
- Lamb price
- Scanning percentage

Prioritise smaller mobs for twins

- Optimum mob size for twins is smaller than singles by ~55% for Merino ewes and ~62% for non-Merino ewes (at the same stocking rate)

		Singles	Twins
Merino	3.6 DSE/ha	335	151
	7.2 DSE/ha	290	133
	14.4 DSE/ha	263	122
Non-Merino	3.6 DSE/ha	346	130
	7.2 DSE/ha	296	115
	14.4 DSE/ha	269	106

Scenario:

- Permanent fencing, without benefits of improved pasture utilisation
- 20% ROI
- Lamb at $6/kg

Lower costs of subdivision = smaller mobs

- Optimum mob sizes ≈35% smaller for temporary vs permanent fencing
  - Reduced by about a further 45-55% if a water supply is not required

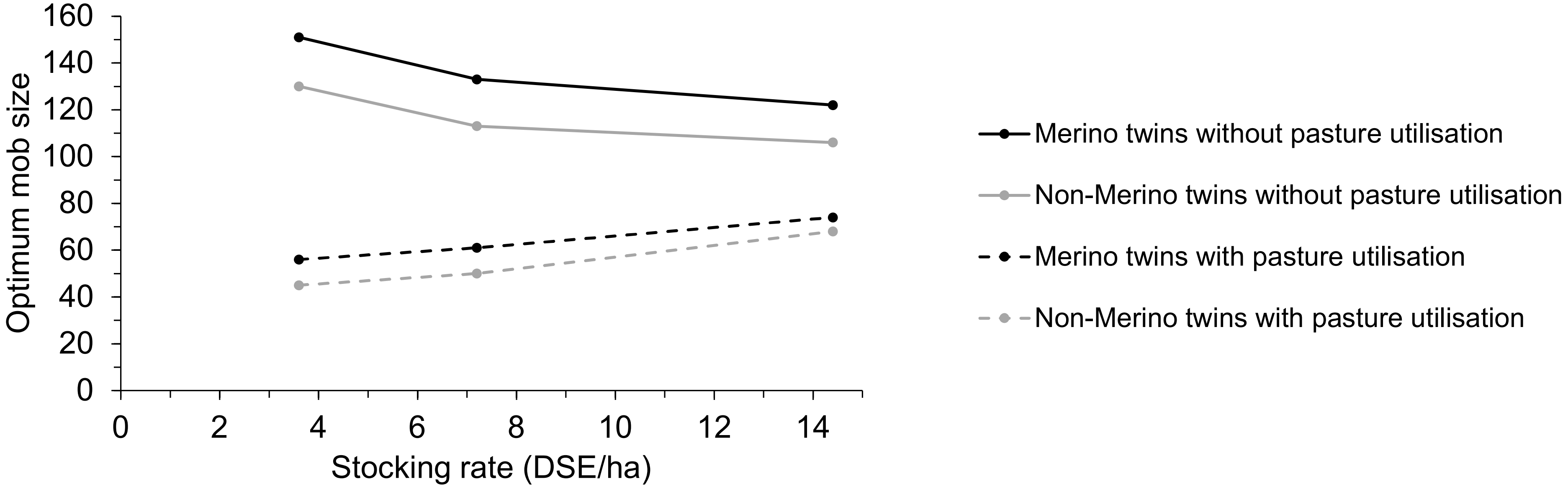
Stocking rate (DSE/ha)	Subdivision type	Merino twins	Non-Merino twins
7.2	Permanent	133	113
7.2	Temporary with water	87	77
7.2	Temporary without water	45	40
14.4	Permanent	122	106
14.4	Temporary with water	80	71
14.4	Temporary without water	37	31

Scenario:

- Without benefits of improved pasture utilisation
- 20% ROI
- Lamb at $6/kg

Permanent fencing & improved pasture utilisation

- Optimum mob sizes are ≈60% smaller if the impacts of pasture utilisation are included and this effect is greater at lower stocking rates



Scenario: 20% ROI & lamb at $6/kg

Greater gains can be made by splitting up bigger mobs

Optimum mob size for twin-bearing Merino ewes

Return on investment		5%	10%	20%	50%
Subdivision type	Permanent	181	218	290	453
	Temporary with water	119	143	191	298
	Temporary without water	67	81	108	168

Scenario: stocking rate 7.2 DSE/ha, without benefits of improved pasture utilisation, lamb at $6/kg

Optimum mob size is less sensitive to;

- **Stocking rate**: ↑ SR = ↓ mob size, until pasture utilisation is maximised
- **Breed**: ↓ mob size for non-Merinos than Merinos
- **Lamb price**: ↑$/kg = ↓ mob size
- **Scanning percentage**: ↑ scanning % = ↓ mob size

Reallocating ewes within existing paddocks

- Must be preg scanning for multiples
- Greatest benefits when scanning 150%
- Optimum mob size for twin-bearing ewes ≈ 50% & 43% that of single-bearing Merino and non-Merino ewes
- Annual benefit of up to AU$0.27/ewe for Merinos & AU$0.44/ewe for non-Merinos

Scenario: Splitting mob of 320 twin Merino ewes at 5.3 ewes/ha (60ha) in half with lamb at $6/kg

	Permanent with water	Temporary with water	Temporary without water
Profit from extra lambs – maintenance costs ($/paddock)	1910	1857	1877
Extra profit from higher SR ($/paddock)	2717	-	-
Costs of subdivision ($/paddock)	4566	1175	465
Livestock purchase cost ($/paddock)	7051	-	-
ROI (%)	**40**	**148**	**359**
Annual equivalent (AU$/ewe)	**12.21**	**5.5**	**5.74**
Years to break-even	3	1	1

Scenario: Splitting mob of 320 Merino ewes at 5.3 ewes/ha (60ha) in half using permanent fencing + water with lamb at $6/kg

	Wet-dry (118%)	Single	Twin
Profit from extra lambs – maintenance costs ($/paddock)	932	483	1910
Extra profit from higher SR ($/paddock)	2437	2264	2717
Costs of subdivision ($/paddock)	4566	4566	4566
Livestock purchase cost ($/paddock)	6325	5876	7051
ROI (%)	**31**	**26**	**40**
Annual equivalent (AU$/ewe)	**8.39**	**6.52**	**12.21**
Years to break-even	4	5	3

Key messages

- Prioritise smaller mobs and paddocks for twin-bearing ewes
- Greater gains can be made by splitting up larger mobs
- Permanent subdivision → improved pasture utilisation

Acknowledgements

John Young – economic analysis

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a.lockwood@murdoch.edu.au

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Decisions are complex

Singles or multiples

Number of ewes & number of paddocks

Optimum mob size for your enterprise

Decision support tool

Shelter availability

Historical performance of the lambing paddock

FOO and forage quality

Split lambings & foetal ageing

Target ROI

Ease of subdivision and characteristics of subdivided paddocks

Crop or dedicated pasture paddock

Economic returns

Costs of subdivision

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Scenario: Splitting mob of 320 twin non-Merino ewes at 5.3 ewes/ha (60ha) in half with lamb at $6/kg

	Permanent with water	Temporary with water	Temporary without water
Profit from extra lambs – maintenance costs ($/paddock)	2489	2445	2465
Extra profit from higher SR ($/paddock)	3899	-	-
Costs of subdivision ($/paddock)	4566	1175	465
Livestock purchase cost ($/paddock)	7877	-	-
ROI (%)	**51**	**195**	**471**
Annual equivalent (AU$/ewe)	**17.59**	**7.33**	**7.58**
Years to break-even	3	1	1