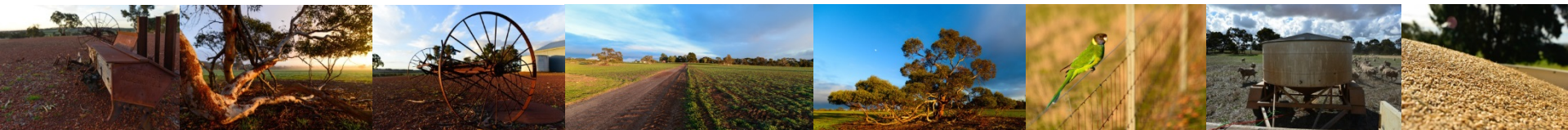
Siblings stop lambs reaching their potential

Khama Kelman, Clair Alston, David Pethick, Graham Gardner

MURDOCH UNIVERSITY
PERTH, WESTERN AUSTRALIA

SHEEPCRC

Lamb weight and growth



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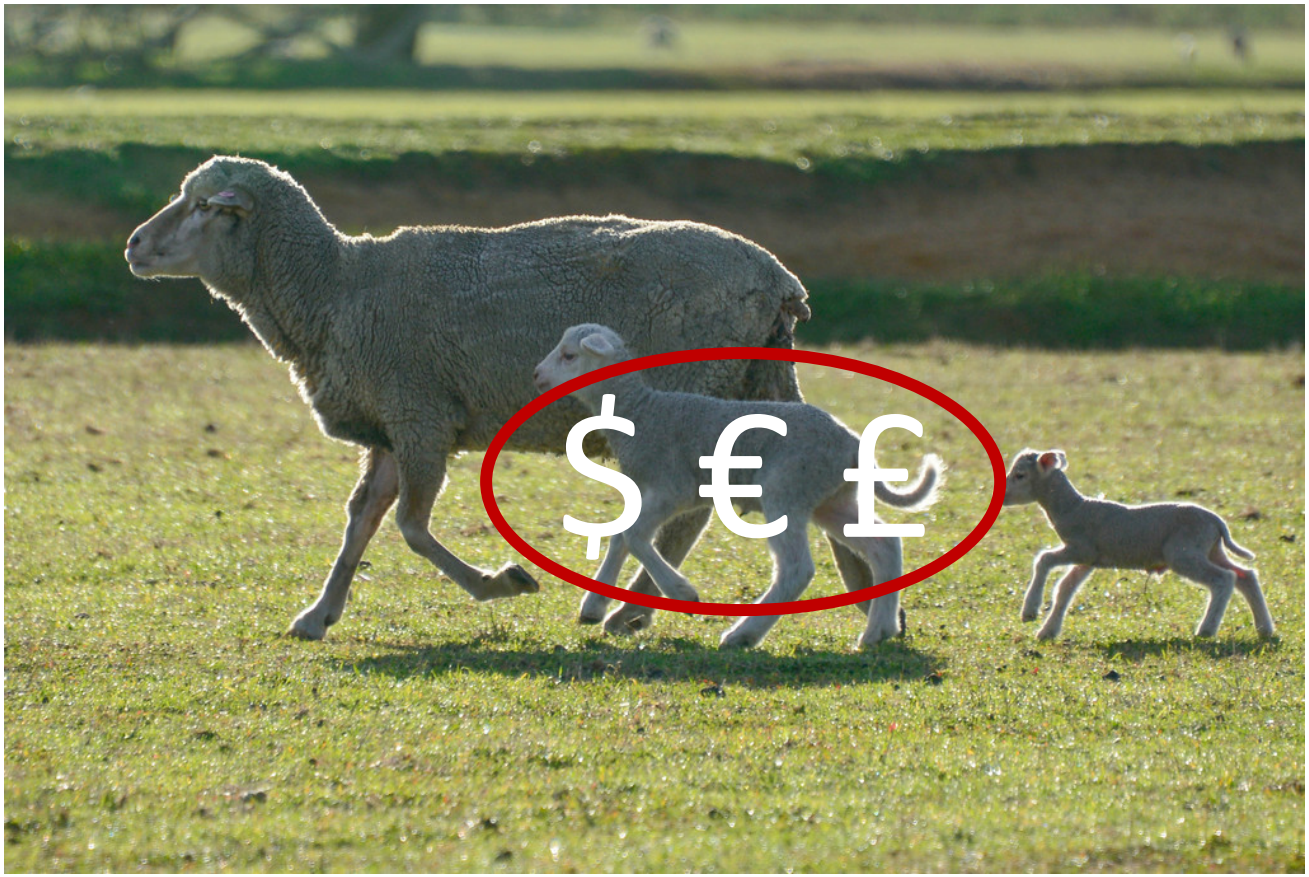
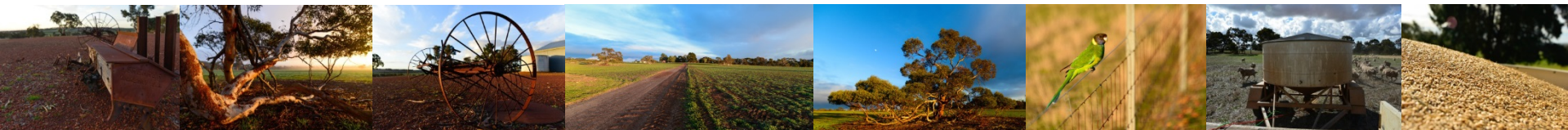
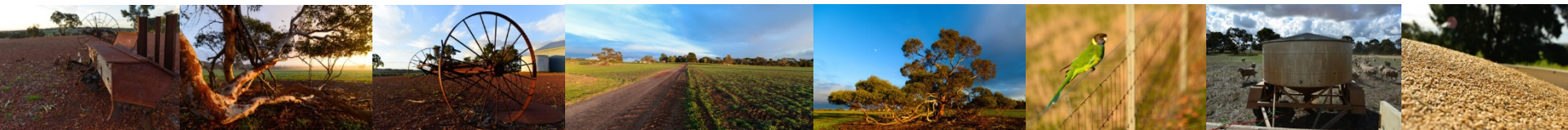




Breeding Objectives

- Large
- Lean
- Muscle



Breeding Objectives

- Large Post Weaning Weight/Growth

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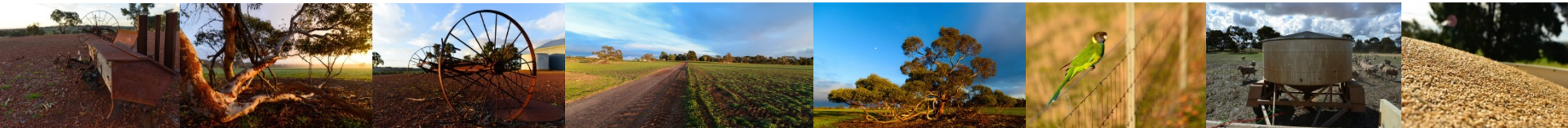
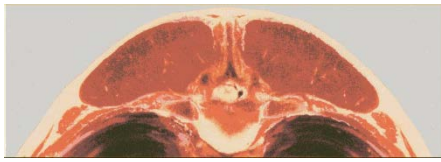


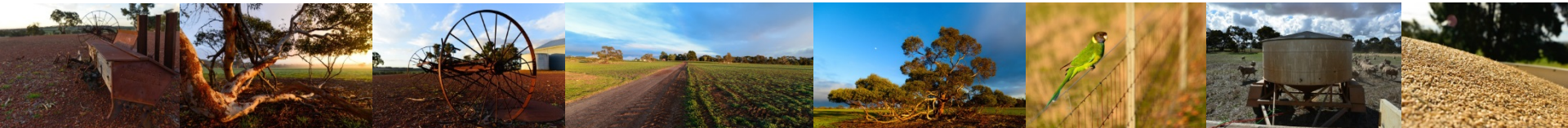
Breeding Objectives

- Large — Post Weaning Weight/Growth

- Lean — Post Weaning Fat Depth



- Muscle



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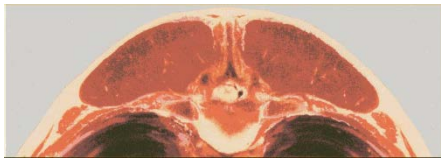
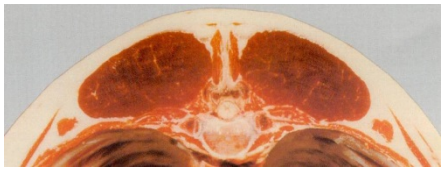
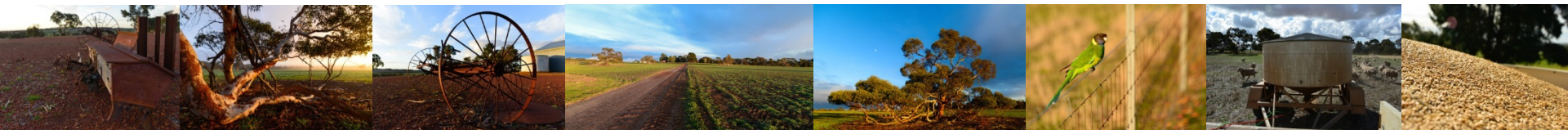


- Muscle — Post Weaning Eye Muscle Depth





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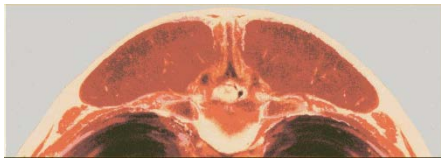

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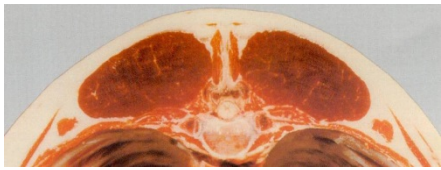
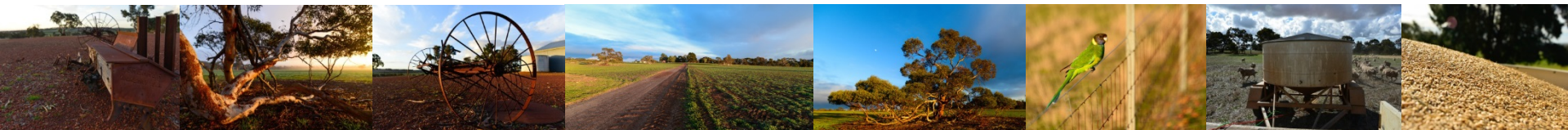




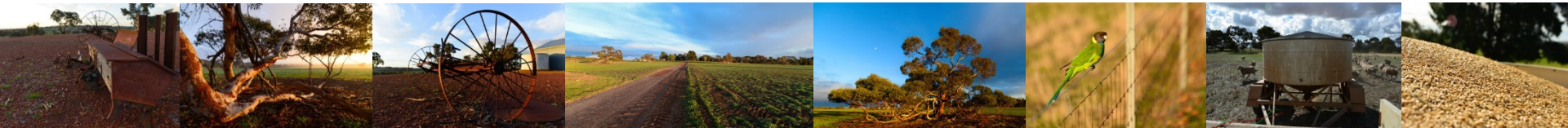
Nutrition and Growth Hypothesis

Increased Growth Breeding Value

Heavier lambs

Restricted nutrition

Reduced response



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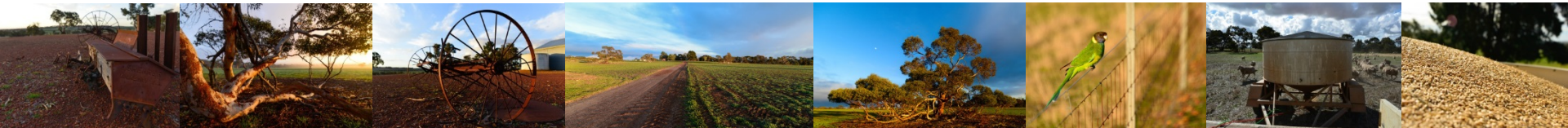
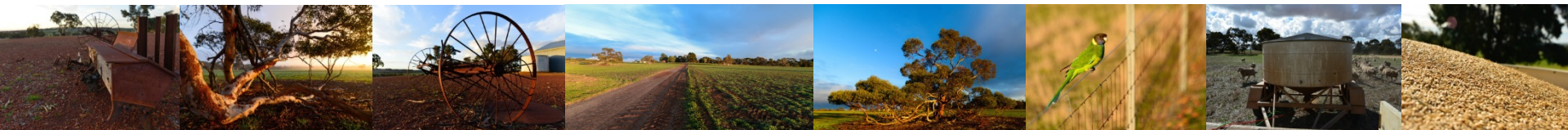
Siblings?



Information Nucleus Flock

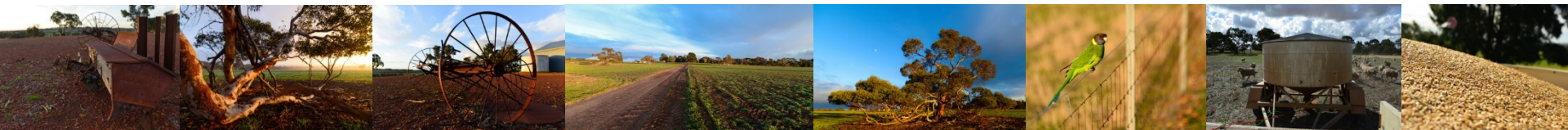
- Sheep Co-operative Research Centre
- 8 sites across Australia with diverse climates
- 100 key industry sires per year
- Terminal, Maternal and Merino sires



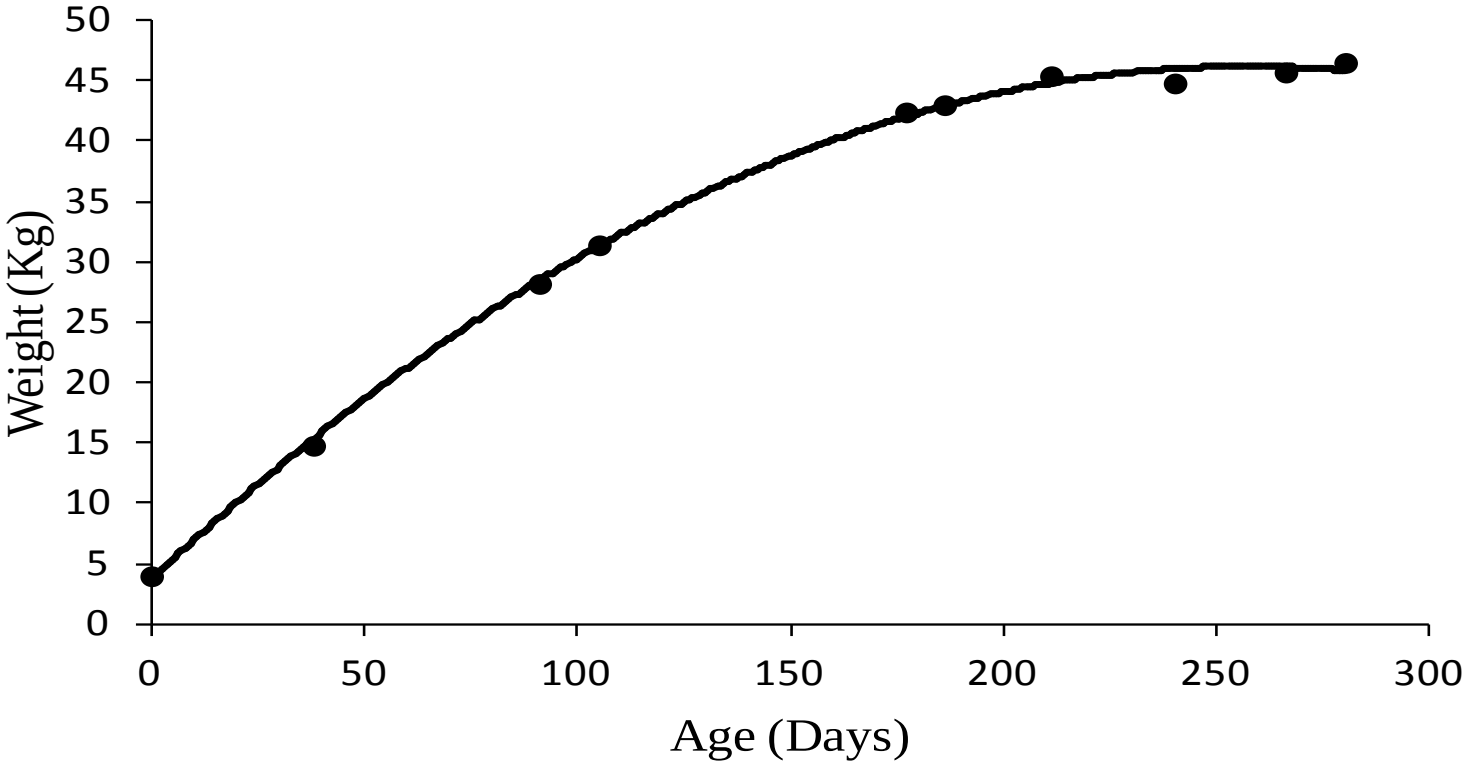
Information Nucleus Flock

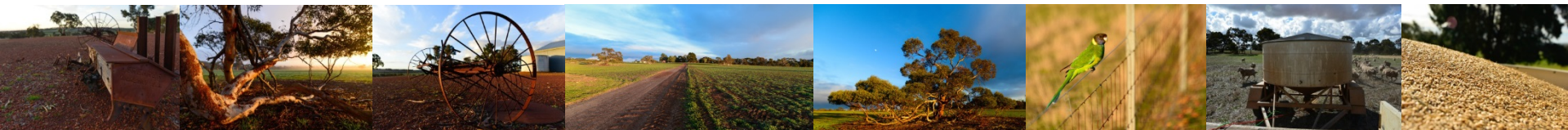
17, 525 lambs

164, 797 weights



Growth Curves





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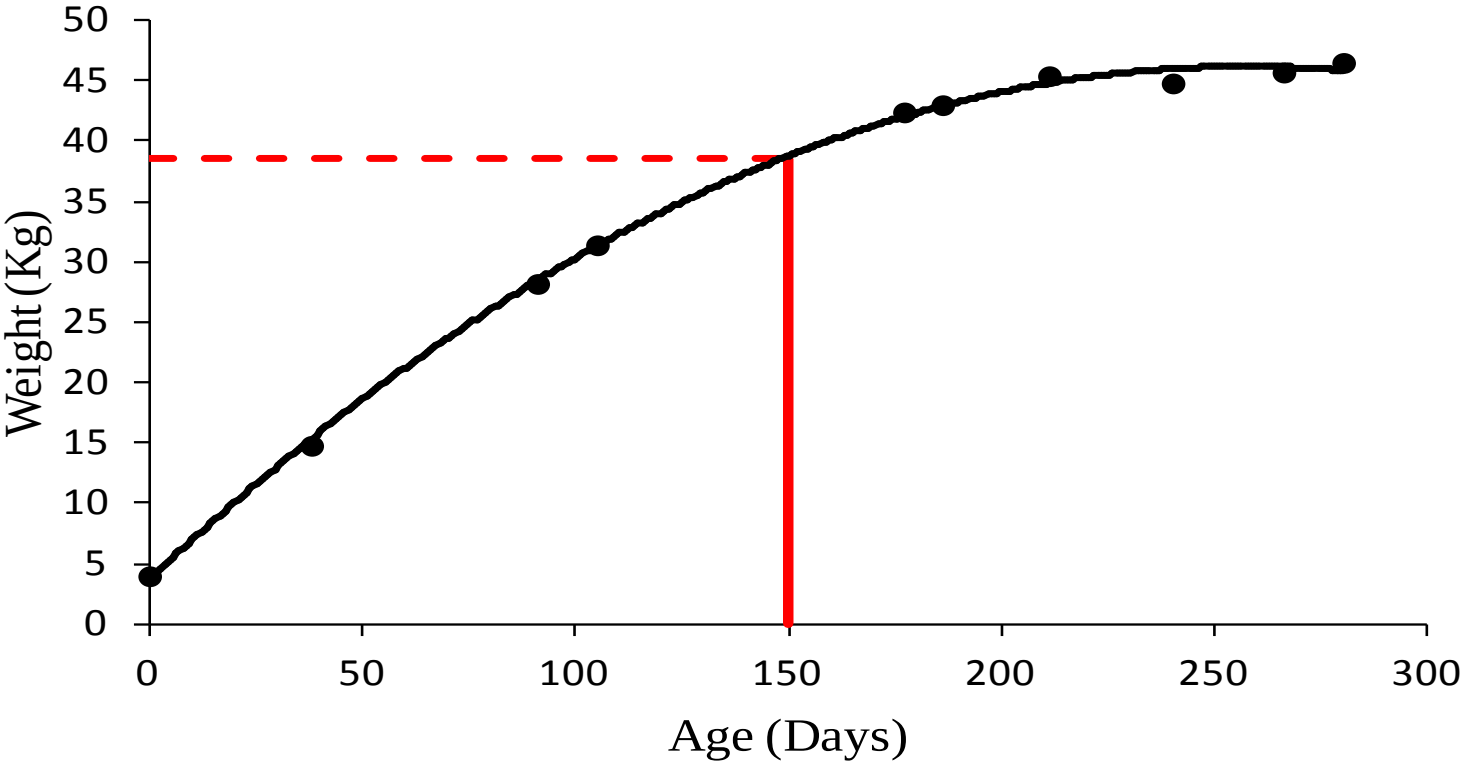
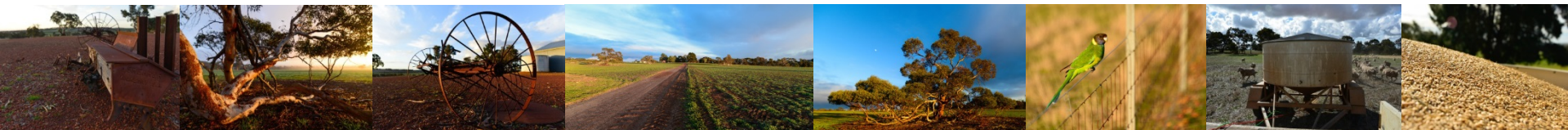
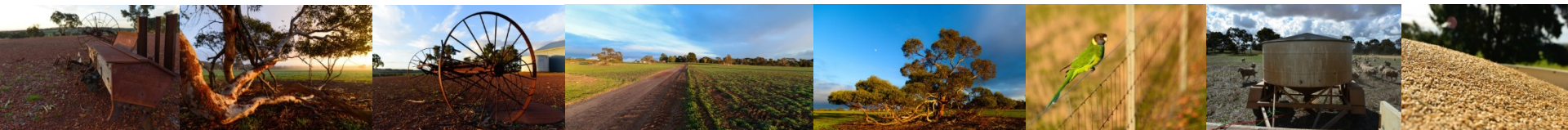




Growth Curves

- Individual Fit - Brodys
  - 3 weights required
  - Predicting at the edge of the data
  - No inference from similar animals
- Population Fit - Random Regression



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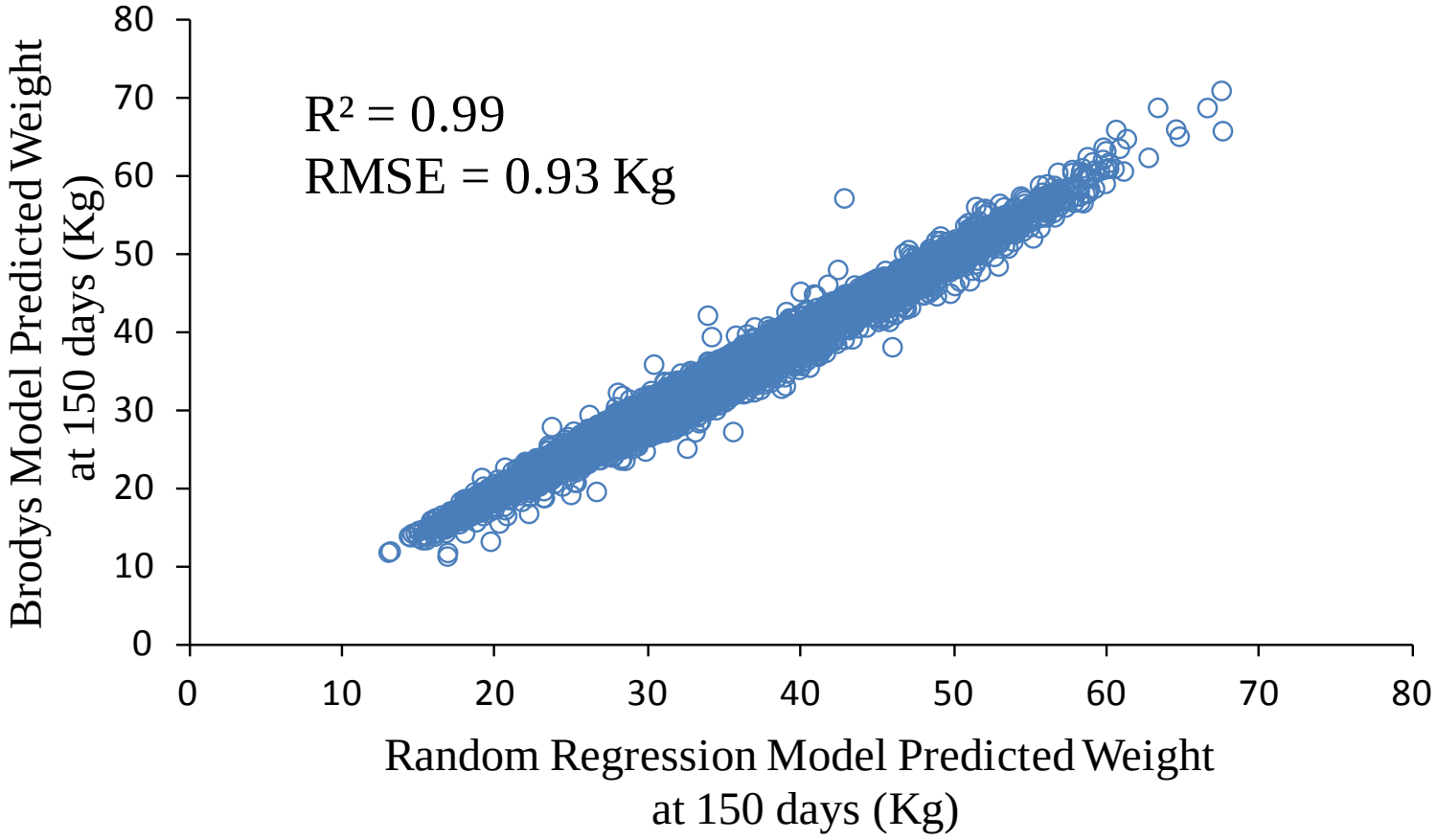
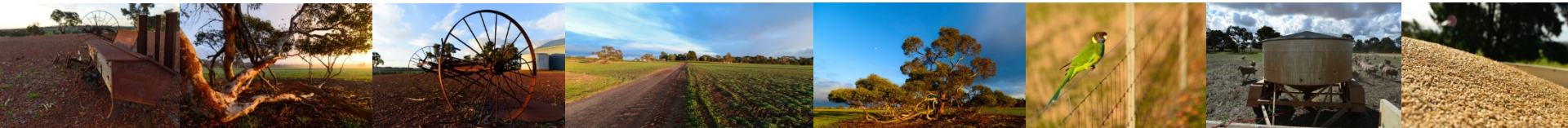




Weight Prediction Model

Fixed Effects*Age^3

Birth type-rear type

Age of dam

Site

Year of birth

Gender

Sire type

Dambreed within Sire type

Random Effects*Age^3

Sire

Dam by year of birth

Individual

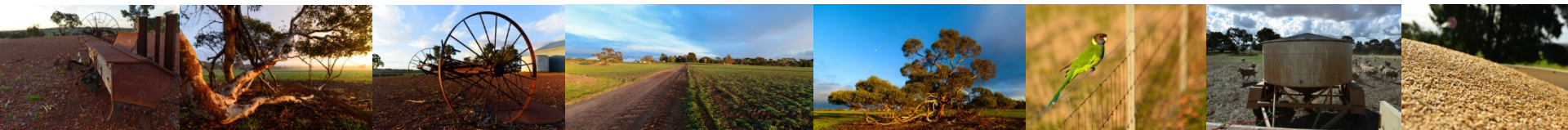
Covariates*Age^3

Growth

Leanness

Muscling

Multivariate normal and half couchy priors, Gibbs sampling



Analysis

Fixed Effects

Birth type-rear type

Age of dam

Site

Year of birth

Gender

Sire type

Dambreed within Sire type

Random Effects

Sire

Dam by year of birth

Individual

Covariates

Growth

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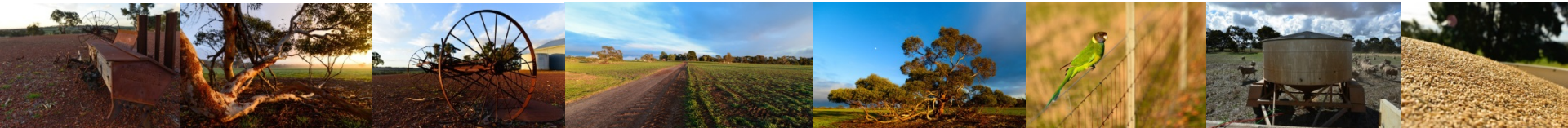
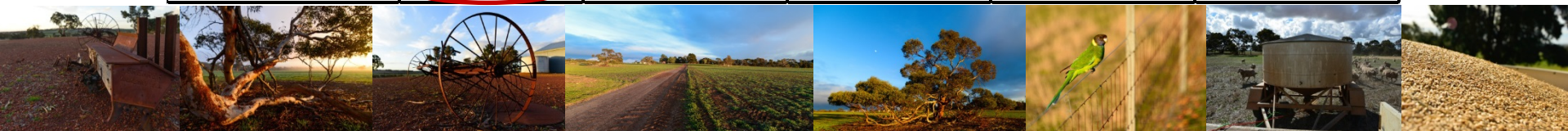
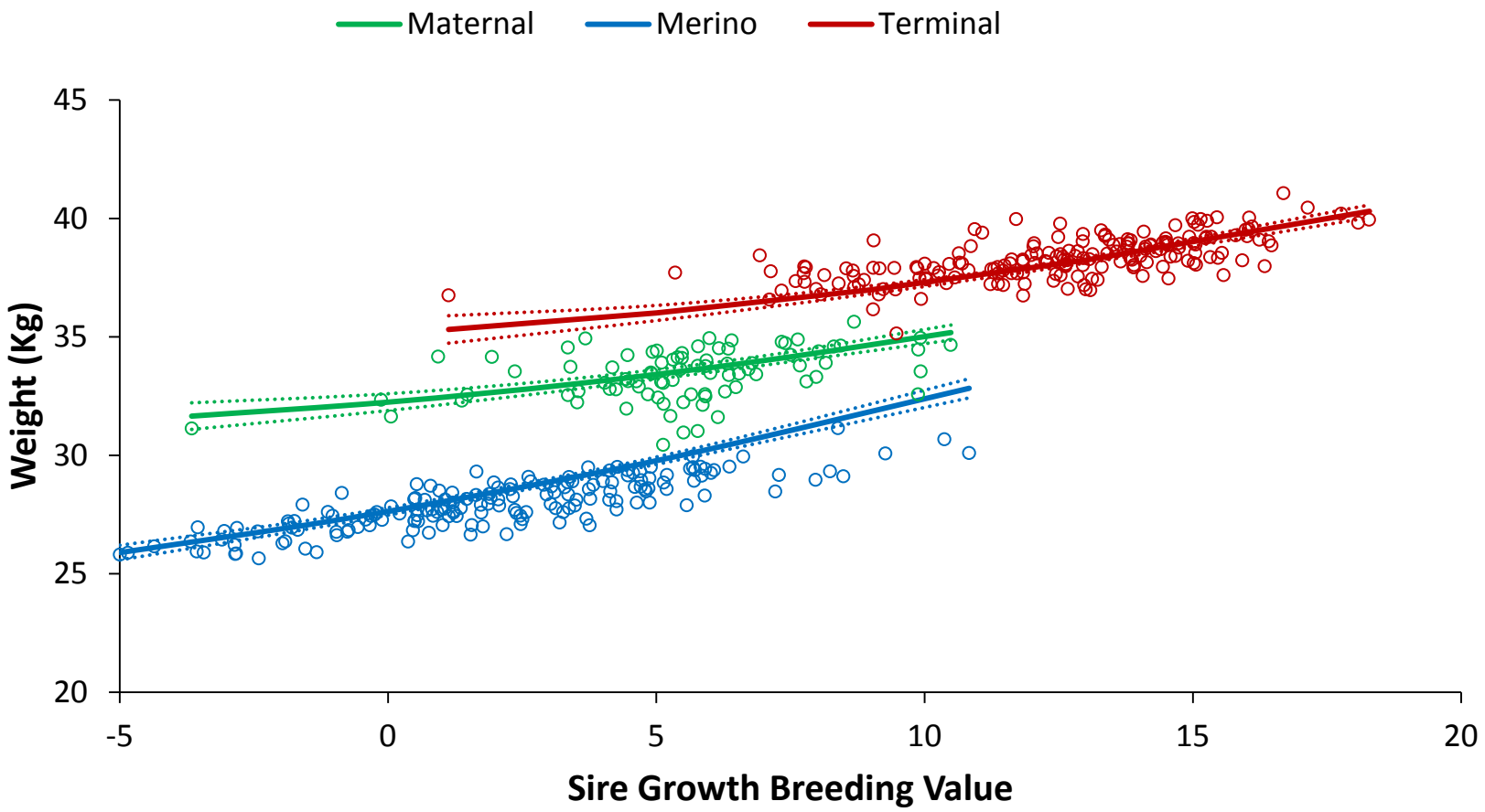


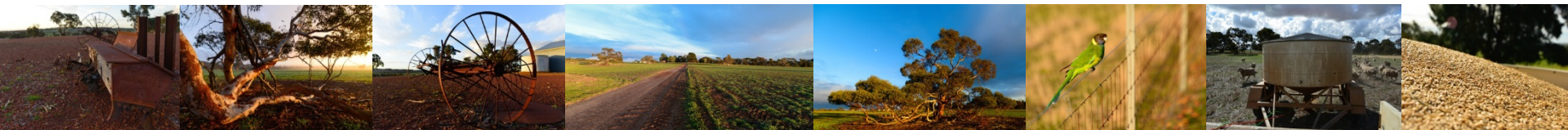
Production Effects

Variable	Level	Birth weight (kg)	Wt day 100 (kg)	Wt day 150 (kg)	Wt day 240 (kg)
Sex	F	4.56 ± 0.02	26.63 ± 0.14	32.52 ± 0.11	40.61 ± 0.08
	M	4.87 ± 0.02	28.22 ± 0.14	34.25 ± 0.11	43.81 ± 0.08
Birth type-rear type	11	5.62 ± 0.02	31.89 ± 0.12	37.50 ± 0.10	45.46 ± 0.07
	21	4.61 ± 0.02	29.27 ± 0.17	35.16 ± 0.14	43.67 ± 0.08
	22	-	26.75 ± 0.12	32.61 ± 0.10	41.80 ± 0.07
	31	3.91 ± 0.03	28.45 ± 0.39	34.44 ± 0.32	42.66 ± 0.17
	32	-	25.09 ± 0.24	31.20 ± 0.20	40.81 ± 0.12
	33	-	23.12 ± 0.31	29.41 ± 0.26	38.86 ± 0.23
Dam age	2	4.41 ± 0.05	27.57 ± 0.32	31.82 ± 0.26	39.00 ± 0.23
	3	4.58 ± 0.02	27.53 ± 0.16	33.47 ± 0.13	42.42 ± 0.09
	4	4.77 0.02	27.83 ± 0.15	34.13 ± 0.12	42.97 ± 0.08
	5	4.78 ± 0.02	28.1 ± 0.15	33.90 ± 0.12	42.66 ± 0.08
	6	4.81 ± 0.02	28.76 ± 0.17	33.82 ± 0.14	42.45 ± 0.09
	7	4.79 ± 0.03	26.91 ± 0.22	33.52 ± 0.18	42.72 ± 0.11
	8	4.86 ± 0.06	25.28 ± 0.36	33.05 ± 0.29	43.25 ± 0.27
Sire type	Maternal	4.62 ± 0.03	27.13 ± 0.27	33.62 ± 0.23	42.46 ± 0.15
	Merino	4.52 ± 0.02	23.43 ± 0.19	28.49 ± 0.16	34.74 ± 0.11
	Terminal	5.01 ± 0.02	31.72 ± 0.17	38.05 ± 0.14	49.43 ± 0.10
Dam breed (Sire type)	Terminal-Merino	4.78 ± 0.03	29.4 ± 0.20	35.63 ± 0.16	47.08 ± 0.10
	Terminal-XB	5.23 ± 0.03	34.04 ± 0.19	40.48 ± 0.16	51.78 ± 0.10



High Growth-Multiple Births





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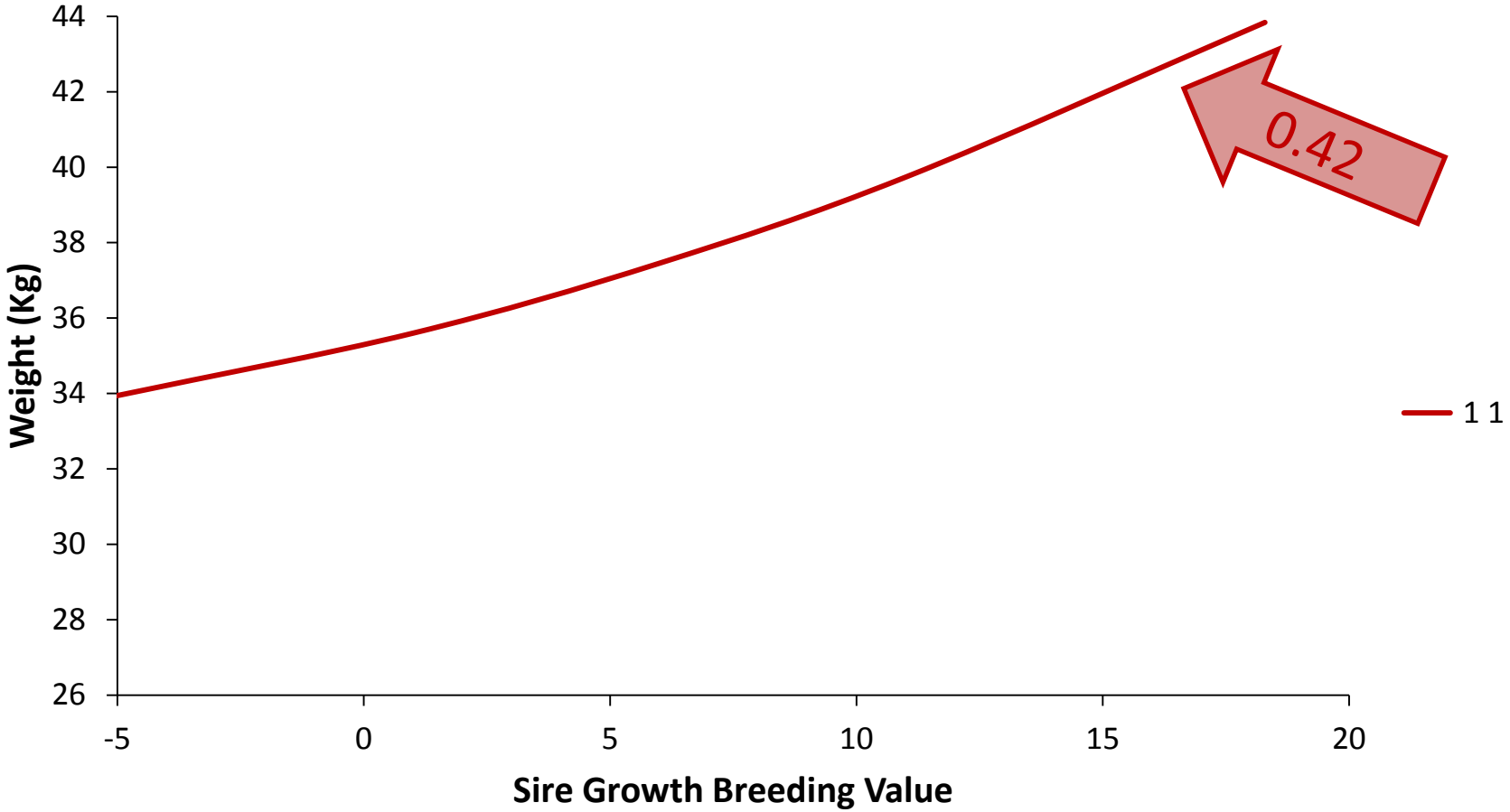

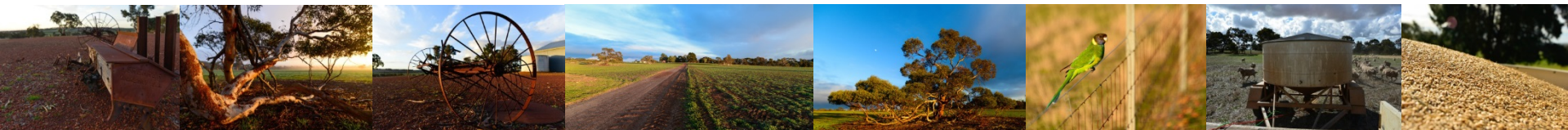

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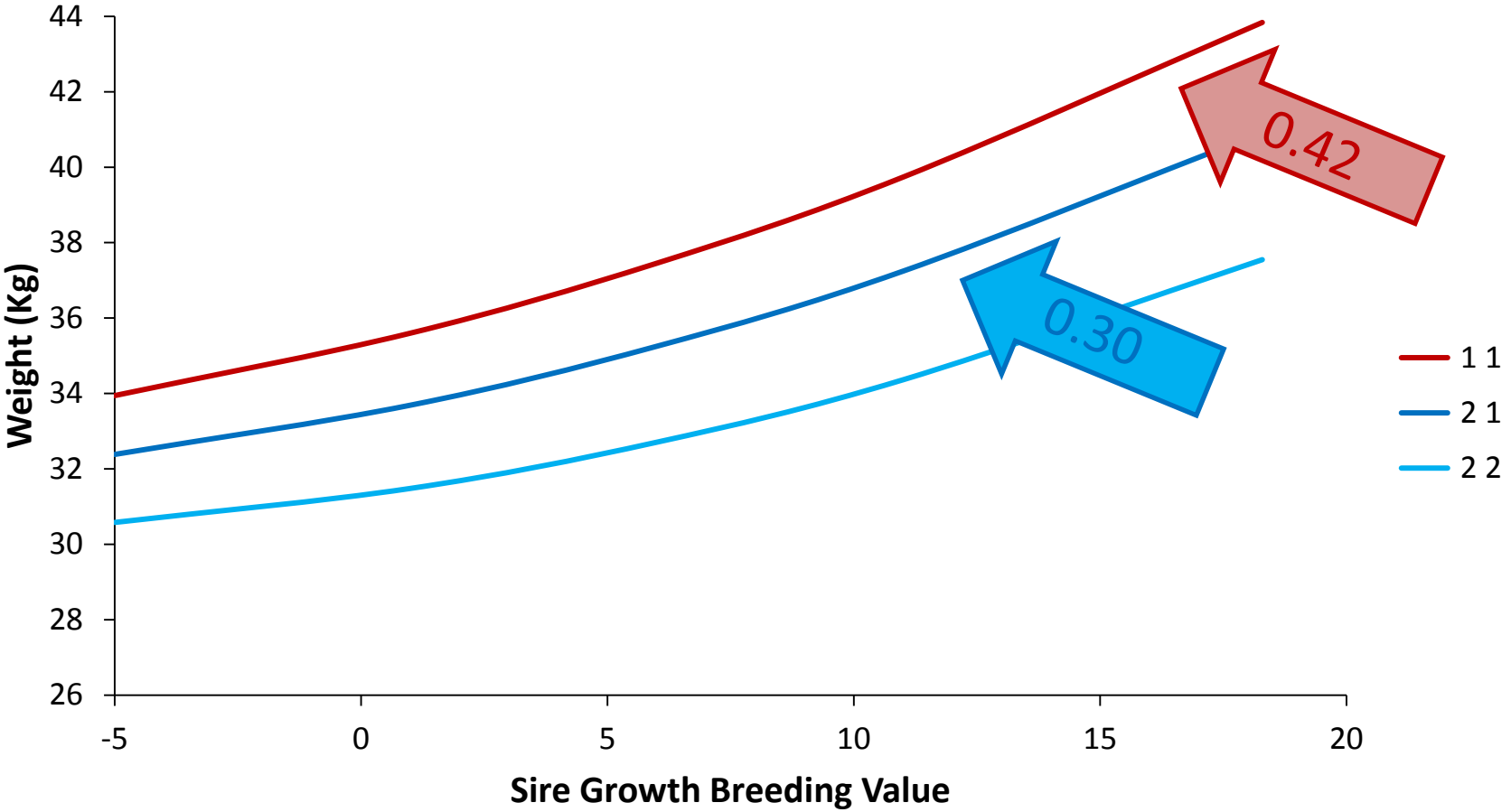

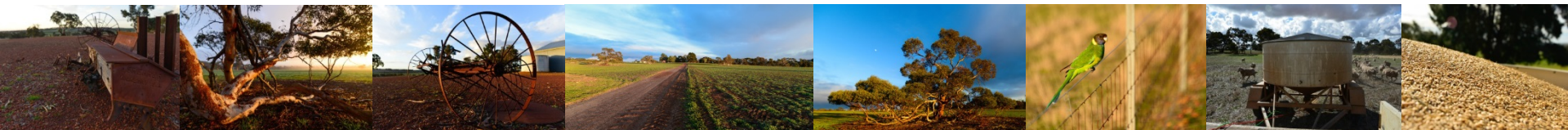

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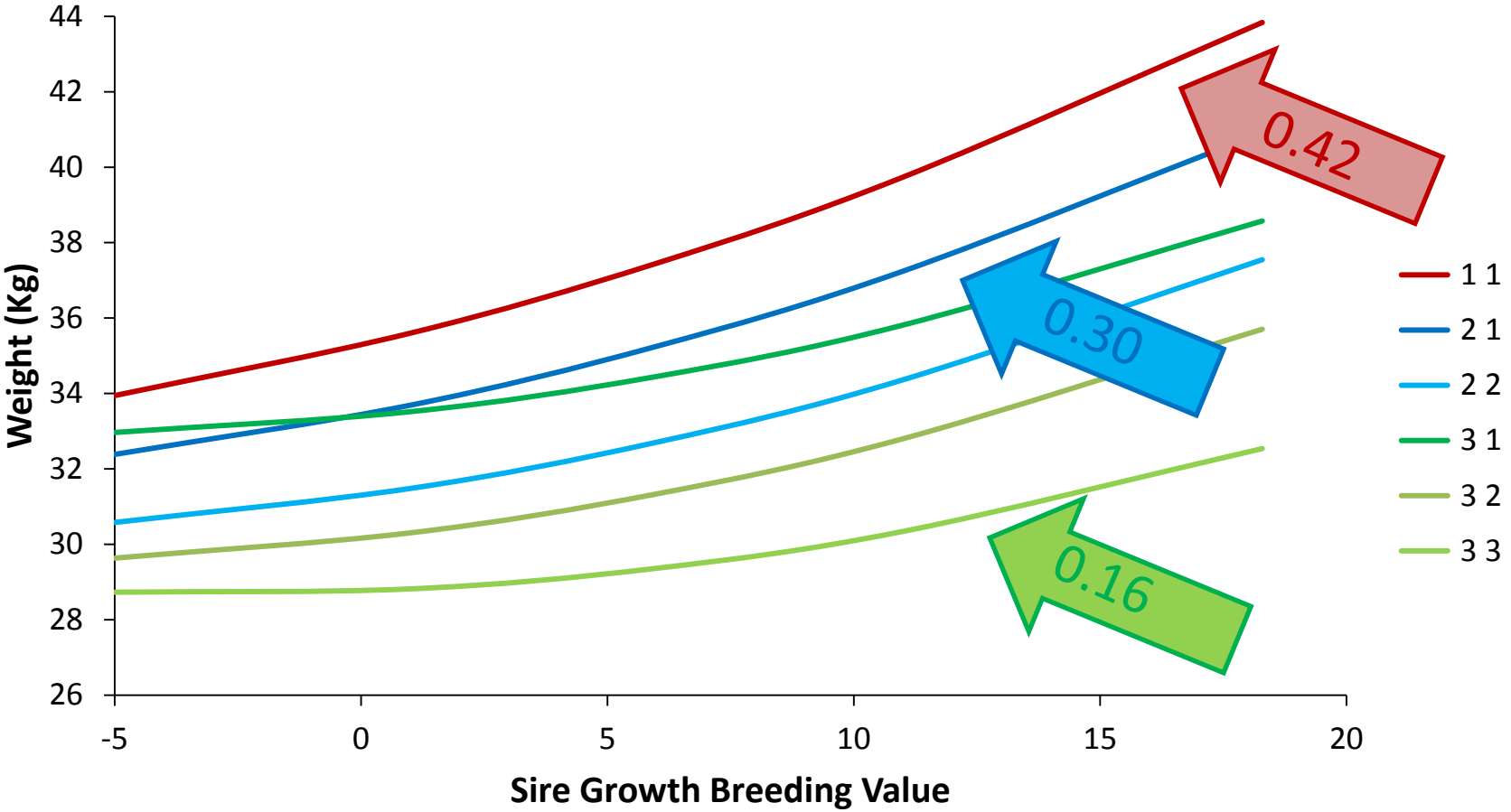

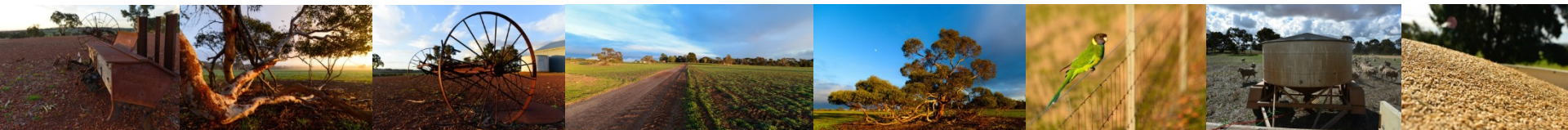

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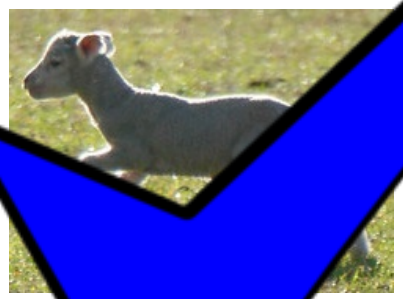
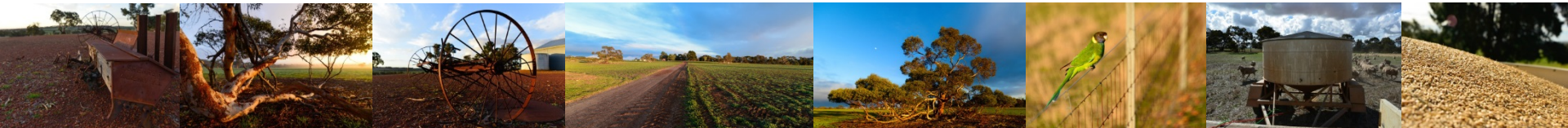


icted nutrition

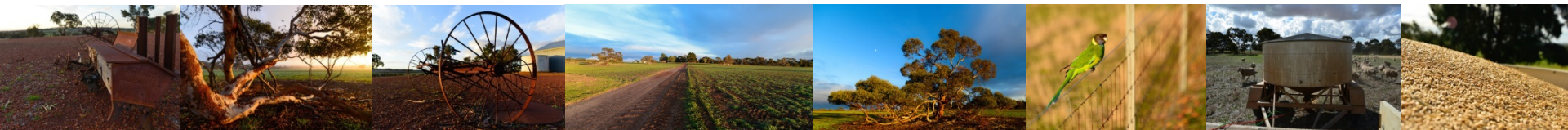
Reduced response

What are the industry implications…..



Industry Implications

- High growth sires attract a premium
- Triplets take 60 extra days each to reach target weights of 35 kg
- Supplementary feeding costs
- Lambing and supply systems



- Lambs with high growth sires do not reach their potential weights when they have siblings

- This effect varies with both birth type and rearing type