

BIOECONOMIC MODELLING OF ALTERNATIVE BEEF FINISHING SYSTEMS IN SCOTLAND

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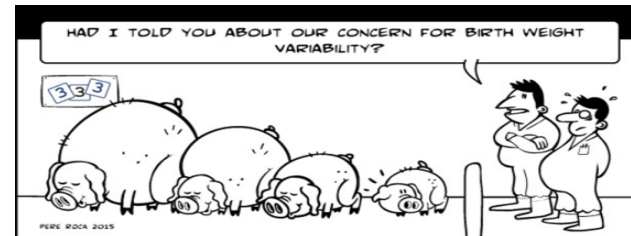
Background



Scottish beef production sector involves approx. 9,000 beef producers and a number of ancillary businesses in the supply chain.

Sources of uncertainty and potential risk factors:

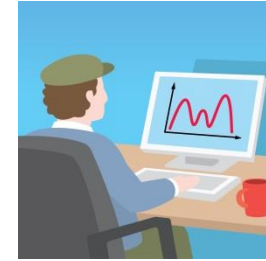
1. Variation in carcass quality
2. Price fluctuation in inputs
3. Latest political developments
4. Continuous regulatory reforms



Livestock Simulation Modelling



Models identify examples to follow and provide information for farmers, policy-makers and stakeholders.



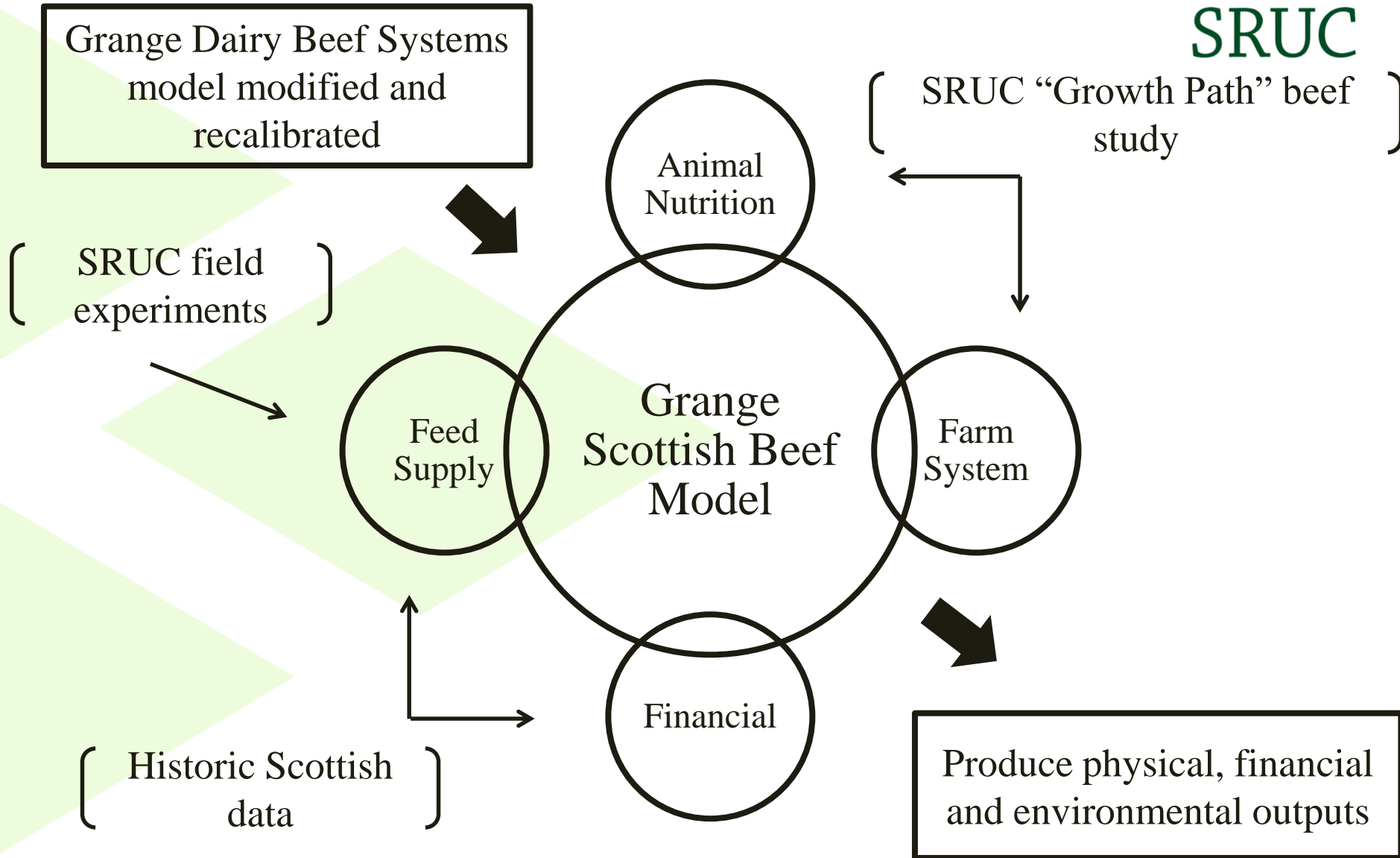
Bioeconomic farm-level modelling: supports decision making by evaluating the effects of different management and breeding strategies on economic efficiency



essentially,
all models are wrong,
but some are useful

George E. P. Box

Grange Scottish Beef Model



Application of the Model



Main Assumptions:

Nitrogen application rate: 175 kg/ha
Utilizable farm area: 120 ha
Concentrate price: 150 £/tonne

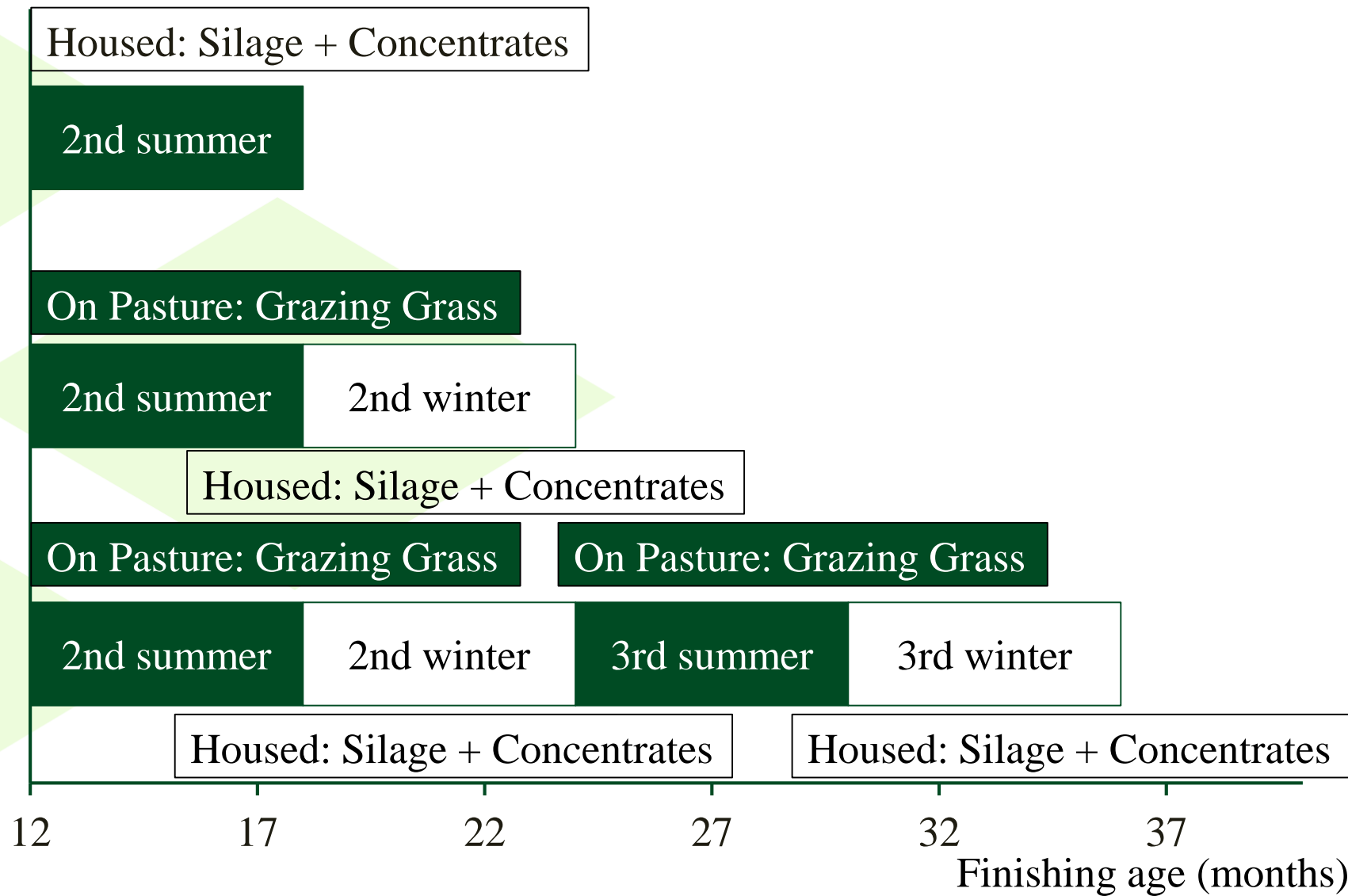
Breed: Limousin crossbreds
Gender: Steers & Heifers
Starting Age: 12 months

Slaughter ages/systems examined by the model:

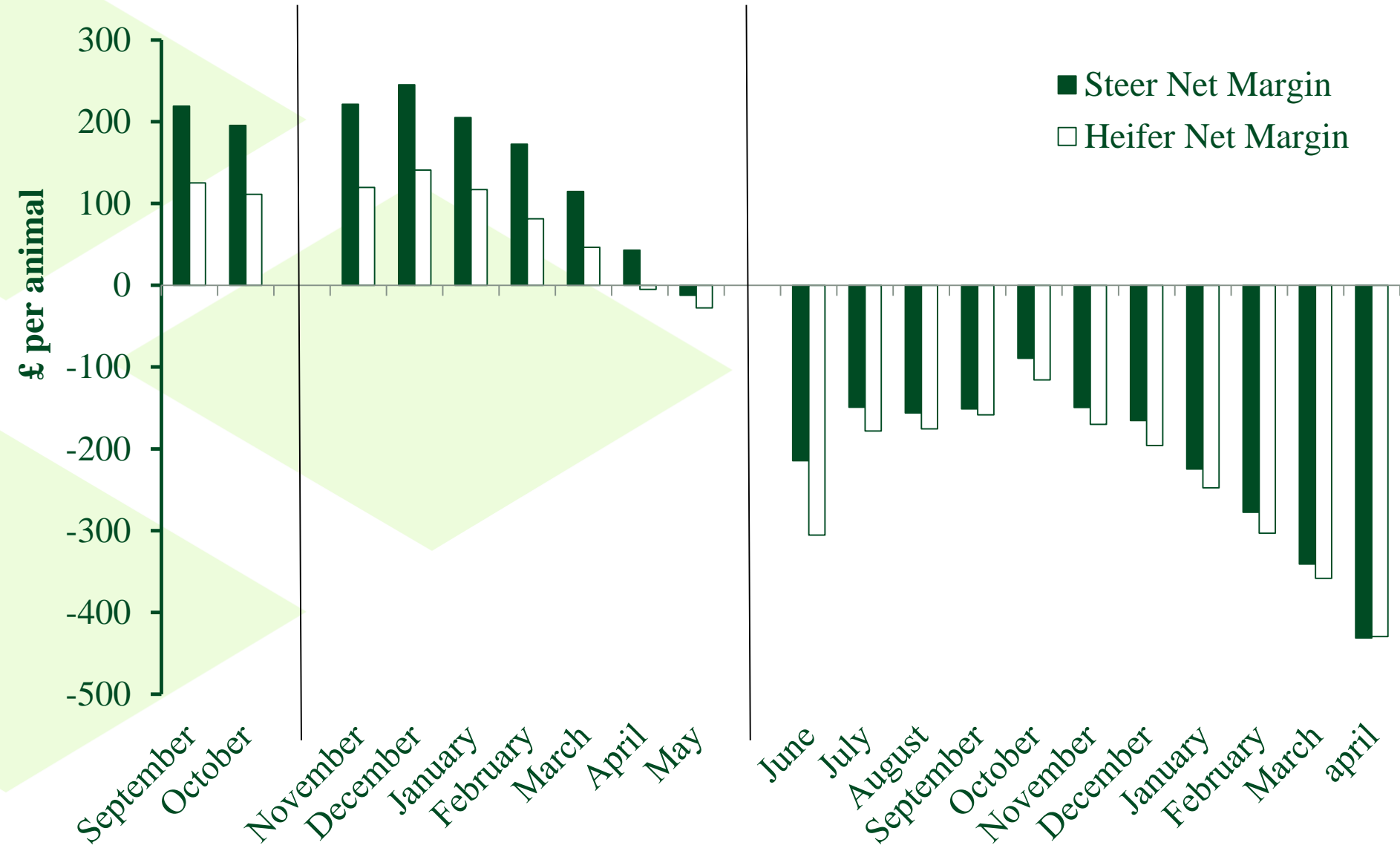
- Short: 16-17 months
- Medium: 18-24 months
- Long: 25-35 months



Finishing Timescales



Baseline Results



Baseline Results (2)



GSBM Results (£ per animal)

Slaughter age	17	18	21	24	25	30	35
Months	October	November	February	May	June	November	April
Steers							
Fixed Costs	165	121	193	270	227	281	436
Variable Costs	397	173	345	517	354	464	720
Net margin	196	222	172	-12	-214	-89	-431
Heifers							
Fixed Costs	168	110	184	266	222	276	428
Variable Costs	347	149	274	363	292	373	606
Net margin	111	120	81	-28	-306	-116	-430

Scenarios



Scenario A: Study the effect of genetically selecting cattle for feed efficiency.

Scenario B: Investigate the influence of intra-population genetic variation in performance.

Scenario C: Assess the impact of currently available subsidies (Basic Payment Scheme and the Greening Payment).

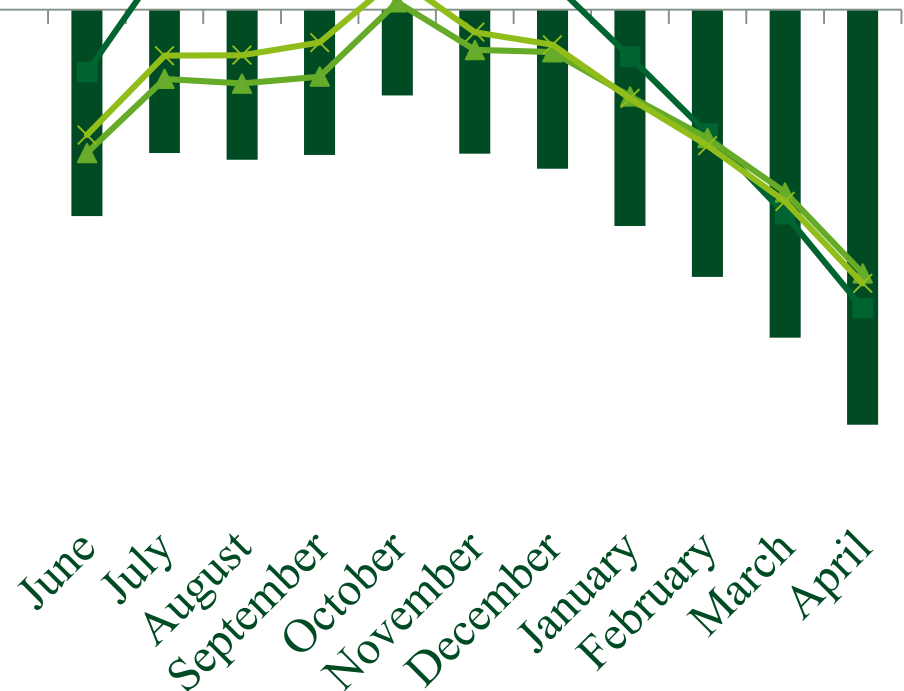
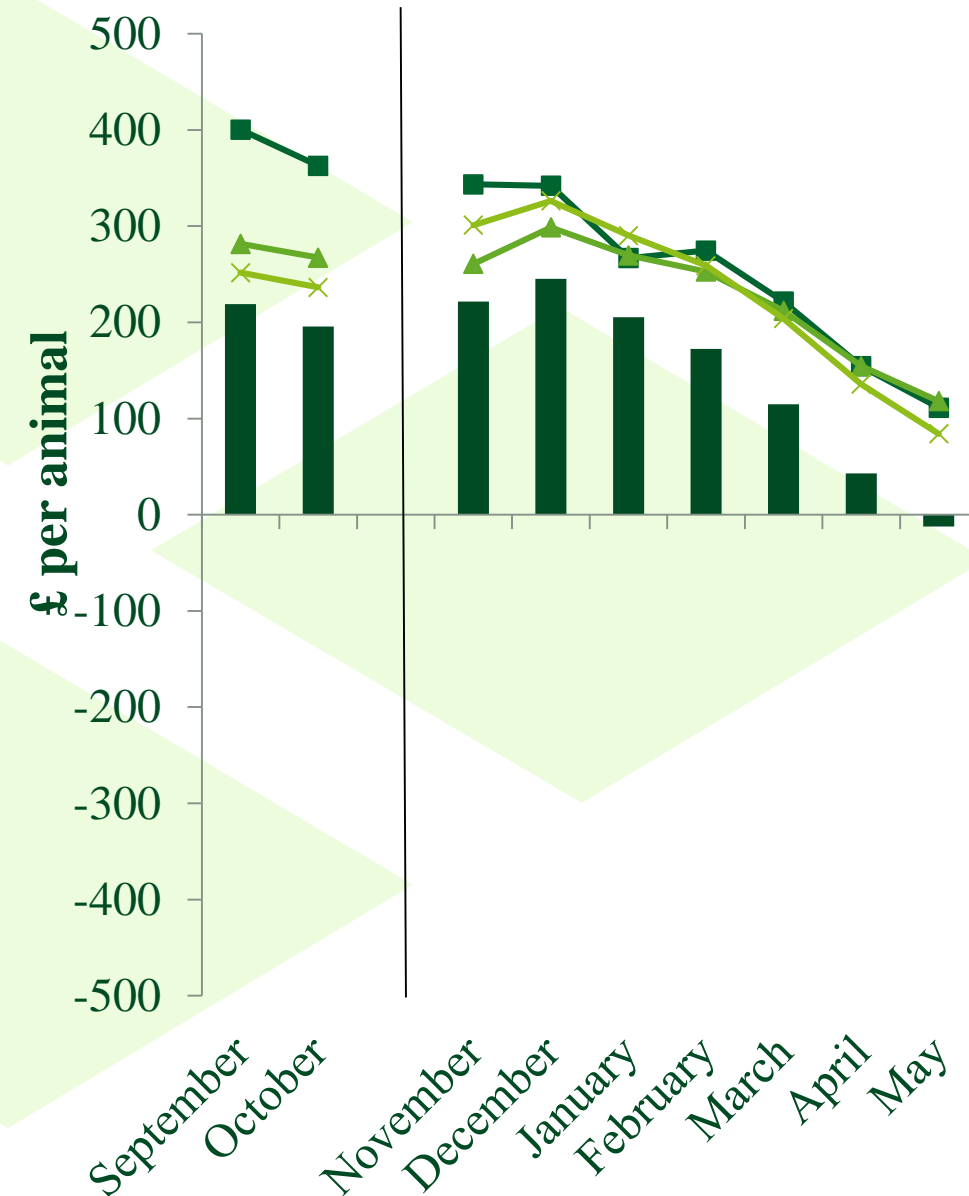


Simulation Outcomes



Steer Systems

- Baseline
- High Growth
- Feed Efficiency
- Subsidies



Financial Results



Scenario A:

£ per animal	Steers	Heifers
Profitable systems	24, 29 months	23, 24 months
Largest Effect	+ £157 (35 month)	+ £80 (24 month)

Scenario B:

£ per animal	Steers	Heifers
Profitable systems	24, 26, 27, 28, 29, 30 months	23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34 months
Largest Effect	+ £208 (27 month)	+ £415 (32 month)

Scenario C:

£ per animal	Steers	Heifers
Profitable systems	24, 29 months	23, 24, 29 months
Largest Effect	+ £147 (35 month)	+ £138 (35 month)

Concluding Remarks



- ❑ Farm physical and financial results largely followed expected trends.
- ❑ **Opportunities exist for profitable beef production in Scotland, particularly for finishing steers at a younger age profile at slaughtering.**
- ❑ **Model revealed which of the interventions simulated were better fit for each beef finishing system examined.**

Future work

- **Measure environmental impact**
- **Optimize outcomes using Linear Programming**

Acknowledgments



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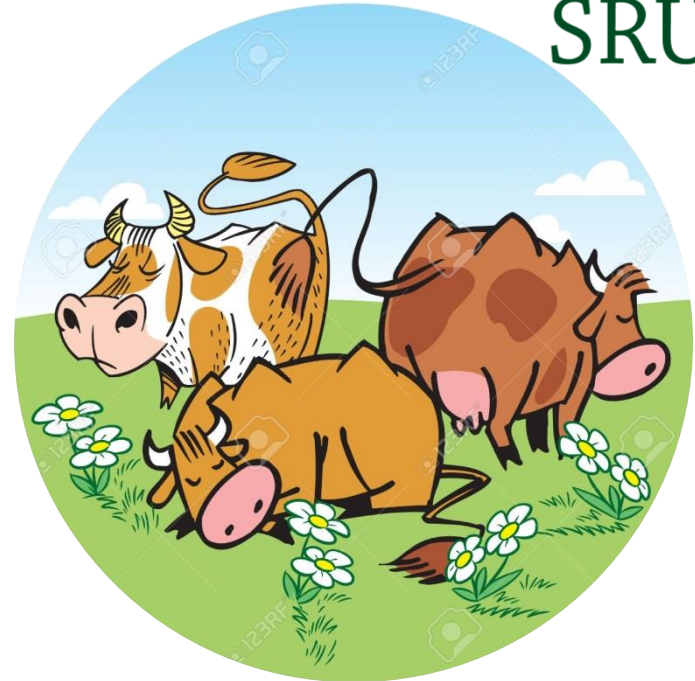
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*Thank you for your
Attention!*





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