Cow calf logistics - markets and environments

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Introduction

In any beef production system (with the exception of white veal) weaners are the engine blocks upon which the system is based. In the agricultural region of Western Australia (WA) weaners are generally defined as calves separated (weaned) from their mothers between 6 to 10 months of age.

In WA there are four distinct markets:

1. **store weaners** ~ 250 – 350 kg live weight; 0-5 mm fat; 6-10 months of age; 0 teeth
2. **grassfed vealers** ~ 340 – 400 kg live weight; 180-220 kg carcase weight, 4-13 mm fat; 6-10 months of age; 0 teeth
3. **grainfed yearlings** ~ 350-500 kg live weight; 180-280 kg carcase weight; 4-13 mm fat, min. 60 days on 50% grain diet; 12-15 month of age; 0-2 teeth
4. **grassfed trade steers** ~ 450-550 live weight; 240-300 kg carcase weight; 4-13 mm fat; 18-21 months of age; 0-2 teeth.

In addition to the market for grassfed trade steers there is also a market for:

- **live export steers** ~ Middle East : 350-500 kg live weight; 0-4 teeth; preferably Bos indicus infused
- **feeder steers** ~ Japan/South Korea; 450-550 kg; 0-2 teeth; preferably Angus, Murray Grey or Shorthorn or European crosses with these breeds.

In the agricultural region most beef production has and continues to take place in the higher rainfall areas of the South West and the South Coast. More recently there has been an extension into the Mid West and to a lesser extent into the Wheat belt. The Mid West is essentially the area between Perth and Geraldton west of the Midlands Highway. It is characterized by significant areas of sand based soils, many of which are suitable for *tagasaste* (a perennial leguminous shrub), which receive between 400 mm and 700 mm of annual rainfall.

This paper sets out to evaluate the economics of beef production in terms of two regions, four production systems and three target markets:

1. South West

- Dairy x British bred females mated to European bulls for vealer production with all replacements bought-in
- British bred females mated to the same British bred bulls for trade steer production with all female replacements generated within in the herd
- 50% of the younger British bred females mated to the same British bred bulls for trade steer production and to generate female replacements and 50% of the older British bred females mated to European bred bulls as terminal sires for trade steer production.

2. Mid West

- British bred females mated to the same bred bulls for weaner production with all female replacements generated within the herd
- British bred females mated to the same British bred bulls for trade steer production with all female replacements generated within in the herd
- 50% of the younger British bred females mated to the same British bred bulls for trade steer production and to generate female replacements and 50% of the older British bred females mated to European bred bulls as terminal sires for trade steer production.

The aim is to ascertain which region and production system is the most economic.

Methodology

The economic analysis used in the paper is based on whole farm budgeting. It incorporates both variable and fixed costs as well as annual capital costs associated with plant replacement.

The analysis evaluates each system in terms of:

- Business margin (analogous to profit before tax)
- $/ha
- $/dse
- $/kg lw
- $/kg cw and
- Return on capital.

Target Markets

Traditionally the vealer market (>200 kg carcase weight; 4-13 mm fat P8; 0 teeth) has been the highest price market for grass-fed beef in the state. However realization by supermarkets and beef processors is that it is more economic to process heavier carcases.

Last year the grassfed trade steer market (240-280 kg carcase weight; 4-13 mm P8; 0-2 teeth) offered a higher price than the vealer market.

Table 1. Price Schedule EG Green & Sons 5 November 2002

Carcase Wt	200-220 kg	220-240 kg	240-280 kg	280-300 kg
Trade Steers	340	345	350	340
Vealer Steers	340	NA	NA	NA

Whether this situation continues into this year and beyond remains to be seen.

In this analysis three target markets have been assumed:

- Dairy x British X European production system ~ target market - vealer
- Britsh x British production system ~ target market – store weaner (usually purchased by a grazier intending to target the grainfed yearling or trade steer/heifer market)
- British x British production system ~ target market - trade steer
- British x British/British x European production system ~ target market - trade steer

Assumptions

As with all economic analyses a number of assumptions need to be made.

Area: South West – 480 ha cleared/pastured; Mid West – 960 ha cleared/pastured

Rainfall: Mediterranean ~ South West -900 mm annual rainfall; Mid West – 450 mm annual rainfall

Stocking Rate: South West ~ 15 dry sheep equivalents (dse) per hectare. One dse is the daily energy requirement to maintain a 50 kg wether (castrated male sheep). This is assumed to be 10MJ/kg DM. Mid West ~ 7.5 dse/ha

Herd Management

Each herd is assumed to run on sub. Clover and annual ryegrass based pastures all year round and fed hay cut from these pastures between February and May.

In the South West these are fertilized with 200 kg/ha of Super:Potash 3:1 (6.8%P; 12.3%K ;8.6%S ;15%Ca) in the Autumn. In the late winter those pastures intended to be cut for hay are assumed to be fertilized with 250 kg/ha of Super:Potash 3:2 (5.5%P; 19.6%K; 6.9%S; 12%Ca) and 100 kg/ha of Urea (46%N).

In the Mid West pastures are fertilized with 100 kg/ha of Super:Potash 3:1 in the Autumn. While those pastures intended for hay production are fertilized with 125 kg/ha of Super:Potash 3:2 and 75 kg/ha of Urea. It is assumed the vealer herd calves from mid January to mid March while the store weaner and trade steer herds calve from mid March to mid May. As a consequence significantly less hay is required for the later calving herds compared to the earlier calving herd.

Research conducted by the WA Department of Agriculture at Esperance indicates later calving cows need only 40% of the hay required by earlier calving cows. In this analysis it has been assumed the later calving store weaner and trade steer herds require 50% less than the earlier calving vealer herd. Calves in the vealer herd are weaned and marketed in November. Calves in the store weaner and trade steer herds are weaned in January. Trade steers and surplus trade heifers are marketed in November. It is assumed 15% of the farm's pasture area is renovated each year. All adult cattle are vaccinated annually with 5-1 and all calves twice each year. All bulls are vaccinated with Vibrovax to prevent the occurrence of vibriosis. All cattle are receiving one back line treatment in early Autumn for internal and external parasite control.

All steer calves and steers as well as sale heifer calves and heifers are implanted with a hormonal growth promotant (HGP). All cows and heifers are pregnancy tested.

Cow Breed Types

Two cow breed types are considered:

- Large size; high milk: Dairy x British bred ~ Friesian x Angus
- Moderate size; moderate milk: British pure bred ~ Angus

Sire Breed Types

Two breed types were considered:

- Moderate size, growth and muscularity and early maturity; British breed ~ Angus, Murray Grey
- Large size, high growth and muscularity and late maturity; European breeds ~ Charolais

Replacement Heifers

In the case of the vealer herd based on Friesian x Angus females all replacement heifers are bought in as two year old PTIC heifers. All store weaner and trade steer herds are self replacing. It is assumed Friesian x Angus heifers can be purchased for $1250 each.

Stocking Rate

The two cow breeds - Friesian x Angus and Angus - differ in live weight, milk production and calf live weight. Consequently they have different daily energy requirements and stocking rates.

Table 2. Cow energy requirements and stocking rates
Cow energy requirements and stocking rates for a range of breed types are outlined in Appendix 1. These are based primarily on data from from the United States Department of Agriculture's Meat Animal Research Centre at Clay Centre Nebraska.

Parameter	Unit	Friesian x Angus	Angus
Live weight	kg	583	555
Milk [a]	kg/day	13.0	8.45
Calf live weight	kg	368 [b]	290 [b]
Energy requirements	MJ.day	134	108
Stocking Rate	Dse/ha	13.4	10.8

[a] Average daily milk production over a 270 day lactation; milk 3.6%F, 8.6% SNF
[b] Average calf liveweight over 270 days

This difference in stocking rate due to differing energy requirements has significant economic implications.

Weaning Rate

- Friesian x Angus: heifers 84%; cows 86%; av.85.8%
- Angus; heifers, cows ~ 84%

Table 3. Weaning Weights

Herd	Friesian x Angus	Angus Weaner	Angus Steer	Angus x Steer
Charolais	371			327
Murray Grey	350			
Angus		290	290	290

Table 4. Turn-off Weights

Herd	Friesian x Angus	Angus Weaner	Angus Steer	Angus x Steer
	kg lw	kg lw	kg lw	kg lw
Cows	583	555	555	555
Heifers		460	460	479
Hfr Vlrs/Wnrs	368	280	280	
Steers			500	519
Str Vlrs/Wnrs	388	300	300	
Bulls	1,000	1,000	1,000	1,000

Steers are assumed to put on 200 kg over a 12-month period and heifers 180 kg.

Table 5. Carcase Weights

Herd	Friesian x Angus	Angus Weaner	Angus Steer	Angus x Steer
	kg cw		kg cw	kg cw
Cows	292	278	278	278
Heifers		244	244	254
Hfr Vlrs/Wnrs	191	146 *		
Steers			270	280
Str Vlrs/Wnrs	206	159 *		
Bulls	540	540	540	540

* converted weaner live weights to carcase weight equivalent

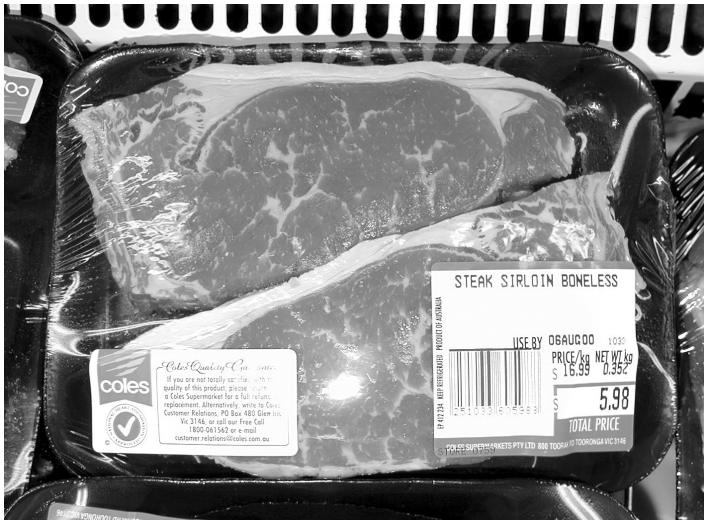
Prices

Although last year, for the first time, trade steer prices were higher than vealer prices during the peak-selling period it has been assumed this will not be the case this year. Instead it has been projected vealer prices will be $0.30/kg carcase weight higher than trade steer prices; $3.30/kg carcase weight compared to $3.00/kg carcase weight. Trade heifer prices have been anticipated to be $0.10/kg carcase weight lower than trade steer prices while cow and bull prices have been assumed to be $1.00/kg carcase weight and $0.90/kg carcase weight lower than vealer prices at $2.30/kg carcase weight and $2.40/kg carcase weight respectively.

Table 6.

Herd	Friesian x Angus	Angus Weaner	Angus Steer	Angus x Steer
	$/kg cw	$/kg cw	$/kg cw	$/kg cw
Cows	2.30	2.30	2.30	2.30
Heifers		2.90	2.90	2.90
Hfr Vlrs/ Weaners	3.30	1.72^	3.30	3.30

^ Converted weaner live weight equivalent



Results of the Economic Analysis

Whole farm budgets for each region and for each production system are outlined in Appendix 2 at the end of the paper.

Table 7

REGION		South West	South West	South West
Parameter	Unit	Friesian x Angus	Angus Steer	Angus x Steer
Area	Ha	480	480	480
Cows	No.	518	397	394
Turnoff	No.	515	324	322
Live	Kg	211,063	150,592	154,416
Carcase	Kg	109,909	79,623	81,669
Live	Kg/ha	440	314	322
Carcase	Kg/ha	229	166	170
Income	$	342,566	231,015	237,910
Expend.	$	320,929	202,209	202,606
Margin	**$**	**21,637**	**28,807**	**35,304**
Capital	$	3,256,390	3,121,416	3,117,132
ROC	%	**0.664**	**0.923**	**1.133**
Income	$/ha	713	481	496
Expend.	$/ha	669	421	422
Margin	**$/ha**	**45**	**60**	**73**
Income	$/dse	48	32	33
Expend.	$/dse	45	28	28
Margin	**$dse**	**3**	**4**	**5**
Income	$/kg lw	1.62	1.53	1.54
Expend.	$/kg lw	1.52	1.34	1.31
Margin	**$/kg cw**	**0.10**	**0.19**	**0.23**
Income	$/kg cw	3.12	2.90	2.91
Expend.	$/kg cw	3.92	2.54	2.48
Margin	**$/kg cw**	**0.20**	**0.36**	**0.43**

Table 8.

REGION		Mid West	Mid West	Mid West
Parameter	Unit	Angus Weaner	Angus Steer	Angus x Steer
Area	Ha	960	960	960
Cows	No.	517	397	394
Turnoff	No.	425	324	322
Live	Kg	153,646	150,592	154,416
Carcase	Kg	80,107	79,623	81,669
Live	Kg/ha	160	157	161
Carcase	Kg/ha	83	83	85
Income	$	240,697	231,303	238,198
Expend.	$	216,056	206,915	206,815
Margin	**$**	**24,641**	**24,388**	**31,383**
Capital	$	1,711,635	1,681,416	1,677,132
ROC	%	**1.440**	**1.450**	**1.871**
Income	$/ha	251	241	248
Expend.	$/ha	225	216	215
Margin	**$/ha**	**26**	**25**	**33**
Income	$/dse	33	32	33
Expend.	$/dse	30	29	29
Margin	**$dse**	**3**	**3**	**4**
Income	$/kg lw	1.57	1.54	1.54
Expend.	$/kg lw	1.41	1.37	1.34
Margin	**$/kg cw**	**0.16**	**0.16**	**0.20**
Income	$/kg cw	3.12	2.90	2.92
Expend.	$/kg cw	3.92	2.60	2.53
Margin	**$/kg cw**	**0.20**	**0.31**	**0.38**

Discussion

South West v Mid West

The South West marginally more profitable than Mid West at same herd size BUT capital investment in Mid West to achieve a similar profit is c.45% less. Hence return on capital in Mid West is 60% higher! For example investment in Angus X Angus steer system in South West is $3.12 m compared to the Mid West where it is $1.68 m. The difference is the value of land. In the South West it has been assumed to be $5000/ha or $2000/ac. Hence the value of 480 ha of South West land is $2.4 million. In the Mid West land is valued at $1000/ha or $400/ac. Thus the value of 960 ha of Mid West land is $1.2 million.

If beef producers moved from the South West to the Mid West and maintained their current herd size they could achieve the same income with only 55% of the capital outlay. The remaining capital could be invested off-farm and generate a substantial off-farm income. Or, and this is more likely, they could purchase a substantially larger farm in the Mid West and significantly expand their herd size. With $3.1 m South West producers could purchase 1680 ha in the Mid West and increase their herd size from 400 breeders to 700 (based on a cost

of $900 per breeder) assuming they adopted a trade steer production system. A business of this size would generate a surplus of $120000 compared to $29000 in the South West and a return on capital of 4.4% in contrast to 1.0% in the South West.

Weaner v. Vealer v. Trade Steer Production

Trade steer production based on crossbred steers is more profitable than trade steer production based on purebred steers. Both are more profitable than vealer production in the South West.

Weaner production in the Mid West is as profitable as trade steer production based on purebred steers but marginally less profitable than trade steer production based on crossbred steers.

Vealer production in the South West has a lower profitability due primarily to the high cost of replacement females - $1250 per head for PTIC

Friesian X Angus heifers. In essence the higher productivity of the Friesian X Angus female does not compensate sufficiently for the higher purchase cost. This suggests Friesian X Angus females are overvalued!

Purebred trade steer production is marginally less profitable than crossbred trade steer production. If purebred trade steers are required, for example as feeder steers for the Japanese market, a price premium of between 5 and 10 cents per kilogram live weight would be required to generate a profit comparable to that produced by crossbred trade steer production.

At a price of $3.00/kg carcase weight and a dressing percentage of 54% this would equate to a live weight price of $1.62/kg livesweight Live exporters would have to offer a price similar to this to bid steers away from the trade steer market.

Summary

Weaner production is the backbone of most beef production systems in the agricultural region of WA.

This paper examines the profitability of:

- Beef production in two regions – the South West and the Mid West and
- Four beef production systems – vealer, weaner, purebred store steer and crossbred store steer

Profitability is examined on the basis of whole farm budgets that take into account variable costs, fixed costs and annualized capital costs.

From this analysis profitability is determined on the basis of annual surplus. In addition:

- Return on capital is calculated as is
- Margin per hectare
- Margin per dse
- Margin per kilogram live weight and
- Margin per kilogram carcase weight

The results of the analysis indicate:

- At the same herd size the South West is marginally more profitable than the Mid West. However,
- The return on capital is much greater (60%) in the Mid West than in the South West; 0.90% c.f. 1.45%. This is due to a
- Much lower capital cost of land in the Mid West compared to the South West; $1000/ha c.f. $2500/ha. To purchase a farm in the Mid West with the same carrying capacity as a farm in the South West requires only 40% of the capital outlay.
- Trade steer production is more profitable than vealer production in the South West. This is due to the high cost of purchasing Friesian X Angus heifer replacements (assumed to be $1250/head).
- Store weaner and trade steer production are similar in profitability in the Mid West.
- Crossbred steer production is more profitable than purebred steer production.
- If purebred steers are required for a particular market, for example the Japanese feeder steer market, a premium of 5 to 10 cents per kilogram live weight will be required over the equivalent trade steer price, to compensate for lower productivity levels
- Similarly if the steers are required for the live export market a live weight price comparable to the equivalent of the trade steer price will be required. At $3.00/kg carcase weight and a dressing percentage of 54% this equates to $1.62/kg live weight.
- The Mid West offers good prospects for South West beef producers being "squeezed" out by alternative land uses.
- Trade steer production in the Mid West based on crossbred steers is likely to be the most profitable beef production system. This will be even more so if trade steer prices in the peak-selling season are similar to vealer prices.

APPENDIX 1: Breed Performance Parameters - Cows and Steers

APPENDIX 2: Whole Farm Budgets - South West and Mid West

APPENDIX 1: Breed Performance Parameters - Cows and Steers

BREED PERFORMANCE PARAMETERS - COWS							8/08/2002				
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CYCLES I, II, III (1970-1990) COW BREED PERFORMANCE PARAMETERS - All Ages											
Breed (a)	**Liveweight**	**Milk**	**Wean Wt**	**Wean Wt**	**Pregnant**	**Births**	**Wean**	**Wean Wt**	**Wean Wt**	**DSE**	**Wean Wt**
			200	**270**				**/Cow Exposed**	**/100 kg**	**Rating**	**/Cow DSE**
			days	**days**					**Cow Exposed**		
	kg	kg/day	kg	kg	%	%	%	kg	kg	dse	kg/dse
Red Poll	499	10.82	217	293	86.6	81.3	76.2	224	45	12.8	22.8
Hereford	522	6.09	185	250	78.9	76.3	68.2	171	33	10.5	23.8
Angus	508	8.45	206	279	84.6	81.0	72.6	202	40	11.7	23.8
Limousin	534	9.27	207	280	74.8	73.4	66.0	185	35	12.3	22.7
Braunvieh	564	**12.91**	**254**	**342**	85.0	82.4	73.9	253	45	**14.7**	23.3
Pinzgauer	544	11.73	241	326	86.3	83.7	74.8	244	45	13.8	23.5
Gelbvieh	571	11.55	248	334	85.2	83.2	75.5	252	44	14.0	23.8
Simmental	573	11.91	248	334	83.1	80.8	70.0	234	41	14.2	23.5
Charolais	**615**	9.55	235	318	83.2	80.8	73.7	234	38	13.4	23.8
MARC 1 (b)	577	11.36	240	323	88.5	85.2	77.6	**251**	43	14.0	23.2
MARC 2 (c)	553	10.64	240	325	84.0	81.5	73.8	240	43	13.4	**24.3**
MARC 3 (d)	546	10.55	225	303	86.0	78.0	70.5	214	39	13.2	23.0
Norwegian Red	502	13.00	213	287	**87.8**	**85.5**	**80.9**	232	**46**	13.9	20.7
Swedish R&W	502	13.00	214	288	77.7	68.4	65.2	188	37	13.9	20.7
Friesian Beef	492	13.00	206	278	84.8	81.5	72.2	201	41	13.8	20.2
Wagyu	449	8.00	181	244	86.8	81.5	74.3	181	40	10.8	22.6
CYCLE VI (1999-2000) HEIFER BREED PERFORMANCES - 2YO											
Hereford	413		207	279	86.0	83.7	76.4	213	52		
Angus	419		219	296	76.0	71.6	65.0	192	46		
Norwegian Red	405		231	312	87.0	84.4	81.2	254	63		
Swedish R&W	405		232	314	77.0	67.5	65.5	205	51		
Friesian	398		224	303	84.0	80.5	72.5	219	55		
Wagyu	363		196	265	86.0	80.5	74.6	198	55		
CYCLES I, II, III (1970-1990) COW BREED PERFORMANCE PARAMETERS - All Ages											
Breed (a)	**Liveweight**	**Milk**	**Wean Wt**	**Wean Wt**	**Births**	**Calving**	**Weaning**	**Wean Wt**	**Wean Wt**	**DSE**	**Wean Wt**
			200	**270**		**Difficulty**		**/Cow Exposed**	**/100 kg**	**Rating**	**/Cow DSE**
			days	**days**					**Cow Exposed**	**Cow**	
	kg	kg/day	kg	kg	%	%	%	kg	kg	dse	kg/dse
Jersey	484	8.4	224	302	90	7	84	254	52	11.6	26.2
Hereford-Angus	555	5.6	215	290	91	13	84	244	44	10.8	26.9
Red Poll	531	6.8	228	308	90	14	79	243	46	11.2	27.4
Devon	557	5.6	214	289	90	10	83	240	43	10.8	26.8
Shorthorn	545	6.2	216	291	93	2	87	254	47	11.0	26.5
South Devon	574	6.0	223	301	88	15	85	256	45	11.2	26.9
Tarantaise	546	7.2	238	321	91	10	85	273	50	11.6	27.7
Pinzgauer	553	7.2	231	312	93	13	85	265	48	11.6	26.8
Brangus	554	6.0	225	304	88	12	84	255	46	11.0	27.6
Santa Gertrudis	569	6.2	229	309	88	6	76	235	41	11.3	27.4
Sahiwal	507	7.8	228	308	**95**	2	**89**	274	**54**	11.5	26.8
Brahman	582	8.2	**244**	**329**	94	1	86	283	49	12.5	26.4
Braunvieh	563	7.6	242	327	92	8	85	278	49	12.0	27.2
Gelbvieh	582	7.6	242	327	**95**	11	87	**284**	49	12.2	26.9
Holstein	583	**10.0**	**244**	**329**	**95**	10	86	283	49	**13.4**	24.6
Simmental	581	7.6	236	319	89	**17**	83	264	46	12.1	26.3
Maine Anjou	619	5.8	237	320	94	11	86	275	44	11.6	27.6
Limousin	560	5.0	220	297	89	12	82	244	43	10.6	**28.1**
Charolais	615	5.0	228	308	88	15	80	246	40	11.1	27.7
Chianina	**621**	5.6	237	320	93	8	86	275	44	11.5	27.8

APPENDIX 1: Breed Performance Parameters - Cows and Steers

CYCLES I, II, III (1970-1990) STEER BREED PERFORMANCE PARAMETERS - All Ages							
Breed (a)	**Liveweight**	**Post Wean**	**Carcass**	**Fat**	**Marbling**	**Retail**	**Retail**
	452	**ADG**				**Product**	**Product**
	days						
	kg	kg/day	kg	mm	score	%	kg
Jersey	445	1.011	269	11.7	**13.3**	65.5	176
Hereford-Angus	474	1.088	289	**16.3**	11.3	66.3	192
Red Poll	451	0.998	280	12.4	11.2	66.6	186
Devon	459	1.003	281	13.9	10.3	67.7	190
Shorthorn	476	1.091	289	13.3	12.6	66.0	191
	(e)	(e)	(e)	(e)	(e)	(e)	(e)
South Devon	491	1.170	297	12.2	11.3	67.7	201
Tarantaise	478	1.079	289	11.2	10.1	69.8	202
Pinzgauer	480	1.111	285	11.7	10.8	69.4	198
Brangus	474	1.080	289	14.4	10.5	66.0	191
Santa Gertrudis	493	1.139	302	15.2	10.7	66.5	201
Sahiwal	453	0.998	277	13.7	9.7	69.1	191
Brahman	484	1.088	301	14.2	9.3	69.4	209
Braunvieh	493	1.120	307	9.9	10.4	69.1	212
Gelbvieh	505	1.161	312	9.4	9.7	69.8	218
Holstein	484	1.123	292	10.7	9.7	70.7	206
Simmental	**518**	**1.220**	305	9.9	9.9	71.0	217
Maine Anjou	514	1.202	**319**	9.4	10.2	70.2	224
Limousin	469	1.052	296	10.4	8.9	72.4	214
Charolais	**518**	1.211	313	9.7	10.3	71.8	225
Chianina	508	1.198	313	8.1	8.5	**73.0**	**228**
(e) Estimates							
Sources :							
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APPENDIX 2: Whole Farm Budgets - South West and Mid West

ANNUAL BUDGET - BEEF FARM ~ MID WEST ~ 450 mm								8/08/2002	
TARGET MARKET :			***STORE WEANER***						
PRODUCTION SYSTEM :			***ANGUS COWS MATED TO ANGUS BULLS***						
REPLACEMENTS:			***SELF REPLACING***						
				Ha					
FARM				1100					
Cleared				960					
Livestock Carrying Capacity				Ha	DSE/Ha	Total DSE			
Total				960	**7.5**	7200			
Beef Cattle Program					Purchases				
		Number	DSE	Value	Births	Deaths	Sales	Number	
		Start			**84%**	2%	15%	End	
Cows		517	**10.8**	**900**	0	10	67	517	
Heifers		129	10	600	0	3	49	129	
Heifer Weaners		0	0	300	217	0	88	0	
Steers		0	10	650	0	0	0	0	
Steer Weaners		0	0	350	217	0	217	0	
Bulls		18	18	3000	4	0	4	18	
Total		664	**7202**	597135	438	13	425	664	
Hay Program				Ha	Yield t/ha	Total t	Retain t	Sell t	
Pasture	Hay	retain		192	3	576	576	0	
Fertilizer Program				Ha	Rate kg/ha	Total t			
Pasture		S:Pot 3:1	7%P 12%K	960	100	96			
Hay		S.Pot 3:2	6%P20%k	192	125	24			
Urea		Urea	46%N	192	75	14			
						134			

APPENDIX 2: Whole Farm Budgets - South West and Mid West

INVESTMENT								
		ha			$/ha			
Land		960			1000			**960000**
		hd			$/hd			
Cattle	CowsPTIC	517			900			465300
	Heifers	129			600			77550
	Steers	0			650			0
	Bulls	18			3000			54285
	Total							**597135**
Plant	Tractor	70 kW						30000
	Tractor	40 kW FEL						15000
	Scarifier	3PL						1500
	Combine	3PL						1500
	Boom Spray	3PL						1500
	Round Roll Hay Baler							30000
	Hay Conditioner							15000
	Hay Rake							5000
	Fertilizer Spreader 1t							3000
	Round Roll Feed Out Trailer							10000
	Post Hole Digger							2000
	Utility 4WD							30000
	Sundries							10000
	Total							**154500**
TOTAL INVESTMENT								**1711635**
RETURN ON INVESTMENT							%	**1.440**

SENSITIVITY ANALYSIS		**RETURN ON INVESTMENT %**				
		Stocking Rate				
	$/kg cw	5.5	*7.5*	9.5	11.5	DSE/ha
Steer	3.10	-1.092	0.504	1.957	3.287	
Vealer	*3.30*	-0.238	*1.440*	2.968	4.365	
Price	3.50	0.617	2.376	3.978	5.444	
			*			

APPENDIX 2: Whole Farm Budgets - South West and Mid West

ANNUAL BUDGET - BEEF FARM ~ MID WEST ~ 450 mm								8/08/2002
TARGET MARKET :			***TRADE STEER***					
PRODUCTION SYSTEM :			***ANGUS COWS MATED TO ANGUS BULLS***					
REPLACEMENTS:			***SELF REPLACING***					
				Ha				
FARM				1100				
Cleared				960				
Livestock Carrying Capacity				Ha	DSE/Ha	Total DSE		
Total				960	**7.5**	7200		
Beef Cattle Program					Purchases			
		Number	DSE	Value	Births	Deaths	Sales	Number
		Start			**84%**	2%	15%	End
Cows		397	**10.8**	**900**	0	8	52	397
Heifers		99	10	600	0	2	38	99
Heifer Weaners		0	0	300	167	0	67	0
Steers		167	10	650	0	3	163	167
Steer Weaners		0	0	350	167	0	0	0
Bulls		14	18	3000	4	0	4	14
Total		677	**7198**	566916	337	14	324	677
Hay Program				Ha	Yield t/ha	Total t	Retain t	Sell t
Pasture	Hay	retain		144	3	432	432	0
Fertilizer Program				Ha	Rate kg/ha	Total t		
Pasture		S:Pot 3:1	7%P 12%K	960	100	96		
Hay		S.Pot 3:2	6%P20%k	144	125	18		
Urea		Urea	46%N	144	75	11		
						125		

APPENDIX 2: Whole Farm Budgets - South West and Mid West

INCOME												
			Liveweight	Price	Carcass	Price	Price	Total				
Cattle			kg	$/kg lw	kg	$/kg cw	$/hd	$				
Cows		52	**555**		278	2.30	638	32940				
Heifers		38	**460**		244	2.90	707	26665				
Heifer Weaners		67	**280**	1.72	146	3.30	480	32428				
Steers		163	**500**		270	3.00	810	132358				
Steer Weaners		0	**300**	1.75	159	3.30	525	0				
Bulls		4	**1000**		540	2.40	1296	5184	$beef/ha/100 mm rf			
Cattle		324	150592		79623			**229575**	53.14			
			157	*kg lw /ha*	*83*	*kg cw /ha*						
Fuel Rebate								**1728**				
								$	$/ha	$/dse	$/kg lw	$/kg cw
TOTAL INCOME								**231303**	240.94	32.14	1.54	2.90
EXPENDITURE		ha	unit/ha	$/unit	$/ha							
Pasture :												
Fertilizer- S:P 3:1		960	100	255	25.50			24480	25.50	3.40	0.16	0.31
Fertilizer- S:P 3:2		144	125	284	35.50			5112	5.33	0.71	0.03	0.06
Fertilizer - Urea		144	75	335	25.13			3618	3.77	0.50	0.02	0.05
Freight/Spread		1104	113	35.00	3.96			4368	4.55	0.61	0.03	0.05
Spray-Rogor		960	0.1	10.00	1.00			960	1.00	0.13	0.01	0.01
Spray-Round-Up		144	1	4.50	4.50			648	0.68	0.09	0.00	0.01
Seed-Clover		144	10	4.00	40.00			5760	6.00	0.80	0.04	0.07
Seed-Ryegrass		144	10	4.00	40.00			5760	6.00	0.80	0.04	0.07
Hay		Rolls/ha	$/Twine	$/Roll	$/ha							
Twine		5	50	1.32	6.07			874	0.91	0.12	0.01	0.01
Cattle :		No.	unit/hd	$/unit	$/hd							
Ivomec	Cows	397	55.5	0.10	5.55			2203	2.30	0.31	0.01	0.03
	Heifers	99	46	0.10	4.60			457	0.48	0.06	0.00	0.01
	Steers	0	50	0.10	5.00			0	0.00	0.00	0.00	0.00
	Bulls	14	100	0.10	10.00			139	0.14	0.02	0.00	0.00
Ear Tags-Calves		333	1	1.00	1.00			333	0.35	0.05	0.00	0.00
Pregnancy Test		496	1	3.00	3.00			1489	1.55	0.21	0.01	0.02
Veterinary		677	1	2.00	2.00			1354	1.41	0.19	0.01	0.02
Vaccine 5-1 Adults		677	1	0.21	0.21			142	0.15	0.02	0.00	0.00
Vaccine 5-1 Calves		333	2	0.21	0.42			140	0.15	0.02	0.00	0.00
Vibrovax-Bulls		14	1	3.50	3.50			49	0.05	0.01	0.00	0.00
HGP-Sale Cattle		269	1	2.50	2.50			672	0.70	0.09	0.00	0.01
Purchase-Heifers		0	1	1	1250			0	0.00	0.00	0.00	0.00
Purchase-Bulls		4	1	1	3500			14000	14.58	1.95	0.09	0.18
Commission		324	1	1	0.00	0%		0	0.00	0.00	0.00	0.00
Levies/Insurance		324	1	1	5.00			1621	1.69	0.23	0.01	0.02
Freight In		4	1	1	50.00			200	0.21	0.03	0.00	0.00
Freight Out		324	1	1	20.00			6484	6.75	0.90	0.04	0.08
Fixed Costs :		ha			$/ha							
Repairs-Fence/Waters		960	1	1	5.00			4800	5.00	0.67	0.03	0.06
Repairs-Machinery		960	1	1	4.00			3840	4.00	0.53	0.03	0.05
Repairs-Vehicles		960	1	1	4.00			3840	4.00	0.53	0.03	0.05
Fuel-General		960	1	1	9.00			8640	9.00	1.20	0.06	0.11
Fuel-Crop		0	1	1	0.00			0	0.00	0.00	0.00	0.00
Licences		1	1	1	1200			1200	1.25	0.17	0.01	0.02
Insurance		1	1	1	6000			6000	6.25	0.83	0.04	0.08
Shire Rates		1	1	1	2500			2500	2.60	0.35	0.02	0.03
Electricity		1	1	1	2500			2500	2.60	0.35	0.02	0.03
Telephone		1	1	1	2500			2500	2.60	0.35	0.02	0.03
Accountant		1	1	1	4000			4000	4.17	0.56	0.03	0.05
Consultant		1	1	1	4000			4000	4.17	0.56	0.03	0.05
Administration		1	1	1	1500			1500	1.56	0.21	0.01	0.02
Manager-Salary		1	1	1	45000			45000	46.88	6.25	0.30	0.57
Manager-WC/Super		15%	1	1	45000			6750	7.03	0.94	0.04	0.08
Interest		10%	1	6	months			8897	9.27	1.24	0.06	0.11
Plant Replacement		13%	1	1	154500			20085	20.92	2.79	0.13	0.25
TOTAL COSTS								**206915**	215.54	28.75	1.37	2.60
								$	$/ha	$/dse	$/kg lw	$/kg cw
MARGIN								**24388**	25.40	3.39	0.16	0.31

APPENDIX 2: Whole Farm Budgets - South West and Mid West

INVESTMENT								
		ha			$/ha			
Land		960			1000			**960000**
		hd			$/hd			
Cattle	CowsPTIC	397			900			357300
	Heifers	99			600			59550
	Steers	167			650			108381
	Bulls	14			3000			41685
	Total							**566916**
Plant	Tractor	70 kW						30000
	Tractor	40 kW FEL						15000
	Scarifier	3PL						1500
	Combine	3PL						1500
	Boom Spray	3PL						1500
	Round Roll Hay Baler							30000
	Hay Conditioner							15000
	Hay Rake							5000
	Fertilizer Spreader 1t							3000
	Round Roll Feed Out Trailer							10000
	Post Hole Digger							2000
	Utility 4WD							30000
	Sundries							10000
	Total							**154500**
TOTAL INVESTMENT								**1681416**
RETURN ON INVESTMENT							%	**1.450**
SENSITIVITY ANALYSIS			**RETURN ON INVESTMENT %**					
			Stocking Rate					
		$/kg cw	6.5	*7.5*	8.5	9.5	DSE/ha	
	Steer	3.10	-1.176	0.441	1.890	3.219		
	Vealer	*3.30*	-0.314	*1.450*	2.914	4.313		
	Price	3.50	0.547	2.335	3.938	5.408		
				*				

Notes