

AgriProfit\$

Benchmarks for Alberta Cattlemen

Economics & Competitiveness

Economic, Productive & Financial Performance Of Alberta Cow/Calf Operations

Aspen Parkland

Production Year - 2003

July / 05



Forward

This *AgriProfit\$ Cost & Returns Report* presents the productive, economic & financial performance of Alberta cow/calf producers in the Aspen Parkland Region for the 2003 production year.

Field research was undertaken through Alberta Agriculture's *AgriProfit\$ Business Analysis & Research* program with the cooperation of producers in the region. The intent of this report is to benchmark three specific management groupings:

- a regional average including all participating producers in the Aspen Parkland grass type.
- an average of the "top performers" within this region. These include the lower 50%* of producers in the region as ranked by unit costs.
- an average (or Provincial Total) of all producers in the research pool.

The primary value of this report is to enable producers to gauge their productive, economic and financial performance relative to their peers locally and provincially. Benchmark analysis, comparing to one's own detailed cost and returns analysis, is the first critical step in identifying operational strengths and weaknesses in a cow/calf operation.

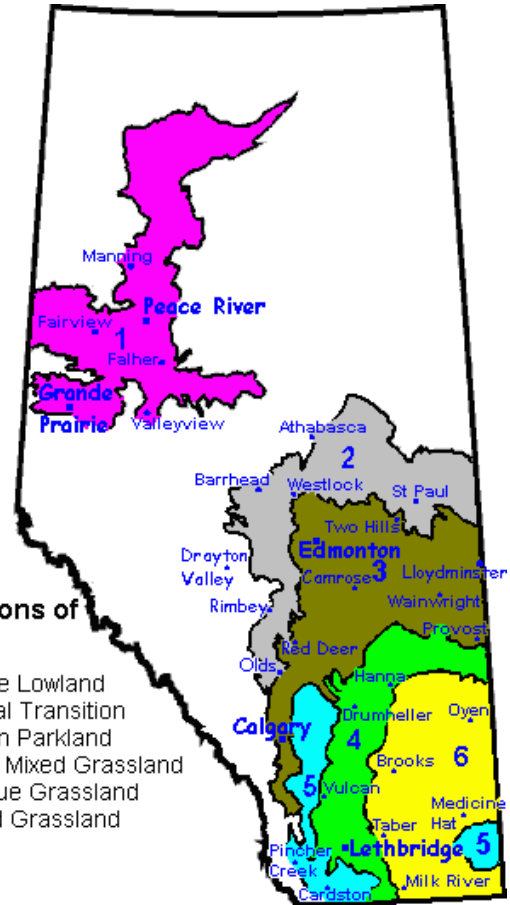
Cost and returns profiles for common forage and grazing crops in the grass type / region are included in this benchmark report in order to put these profit centers into context with the cow herd profiles they support. A list of definitions for common terms employed in this benchmark report is also appended.

The map above illustrates the location of each grass type region within Alberta. This package only reports the results of one specific grass type region, along with comparisons to the provincial total. If you are interested in obtaining information on other regions, please contact the Economics Unit at:

J.G. O'Donoghue Building
#302, 7000 - 113 Street
Edmonton, Alberta
T6H 5T6

Ecoregions of Alberta

1. Peace Lowland
2. Boreal Transition
3. Aspen Parkland
4. Moist Mixed Grassland
5. Fescue Grassland
6. Mixed Grassland



* For this analysis, total production cost per lb. weaned was the sole criteria for identifying the top management ("**Low Cost**") herds within the region. It should be noted, however, that there are several other factors that may contribute to the success of a cow/calf operation.

****Note:** Regional & top management groups had sufficient full farm observations to develop the farm financial benchmarks ... only these are used to develop the farm level financial performance indicators. Enterprise productive & economic information is developed based upon the whole regional sample.

Dale A. Kaliel
Sr. Economist: Production Economics

Brian Perillat
Production Economist: Livestock & Forages

Historical Review of Alberta Cow/Calf Operations Economic, Financial & Productive Performance: 1998 - 2003

Benchmark Comparables: Aspen Parkland, by Year
Enterprise Type: Weaned-Calf

Enterprise Economic Performance: Major Unit Cost Groups *(summing to Total Cost)*

	----- \$ / Lb. Weaned -----					
	1998	1999	2000	2001	2002	2003
Winter Feed & Bedding Costs	0.562	0.402	0.458	0.539	0.681	0.664
Pasture Costs	0.183	0.214	0.287	0.327	0.384	0.297
Labour Costs	0.173	0.178	0.148	0.115	0.130	0.103
Other Variable Costs	0.148	0.172	0.210	0.217	0.217	0.159
Fixed Costs	0.110	0.140	0.126	0.123	0.131	0.115
Total Production Costs	1.177	1.106	1.228	1.322	1.544	1.338

Farm Financial Performance Indicators:

<u><i>ROAD to Profitability</i></u>	1998	1999	2000	2001	2002	2003
Risk (Debt to Asset Ratio)	0.18	0.12	0.14	0.26	0.26	0.13
Operating Expense Ratio	0.62	0.47	0.39	0.59	0.73	1.11
Asset Return	0.06	0.04	0.05	0.04	0.02	(0.05)
Debt Payout to Profitability	3.01	2.32	2.53	6.22	14.14	(3.15)
	104,136	84,941	77,916	77,172	52,517	(73,125)
 <u><i>The "3-C's"</i></u>						
Current Ratio	1.93	3.06	2.68	1.43	1.36	2.96
Calif. Working Cap. Ratio	0.57	0.89	0.89	0.39	0.28	0.76
Capital Turnover Ratio	0.25	0.14	0.15	0.19	0.18	0.09
Farm Size (Acres)	2,155	2,257	1,545	2,163	3,554	2,783

Debt to Assets = Total Liabilities / Total Assets
 Operating Expense Ratio = Operating Expenses / Value of Production
 Return on Assets = Return on Assets / Total Farm Assets
 Debt Payout = Total Liabilities / Net Farm Income
 Profitability = Net Farm Income

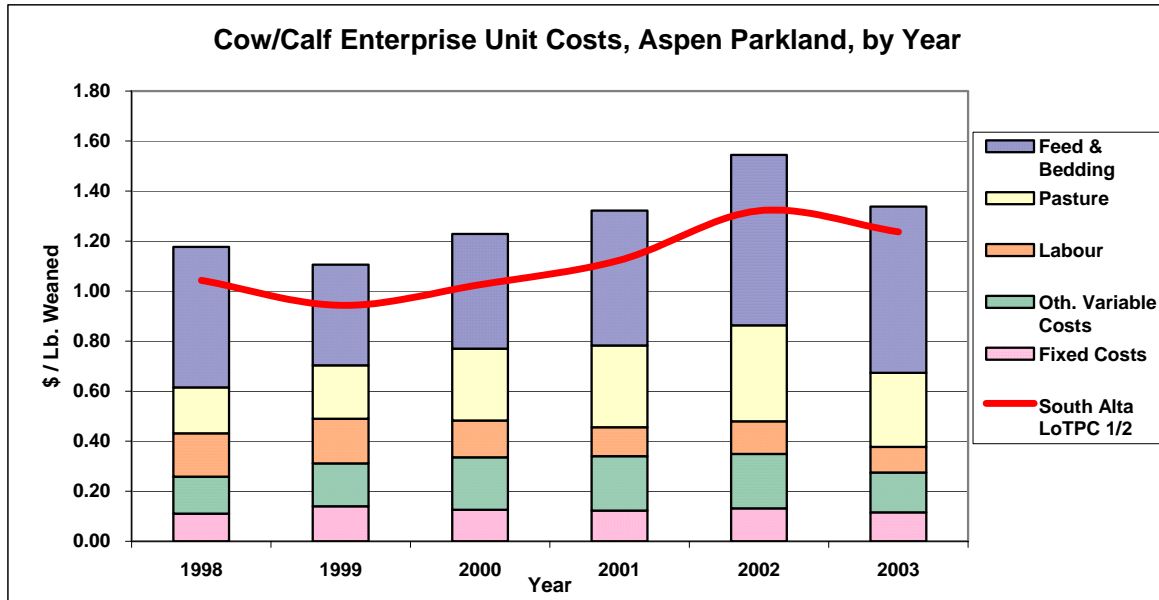
Current Ratio = Current Assets / Current Liabilities
 Calif. Working Cap. Ratio = Working Capital / Total Expenses
 Capital Turnover = Value of Production / Total Farm Assets
 Farm Size = Total Acres in crops, forages & grazing
 (includes all acres owned, rented & leased)

Productive Performance Indicators:

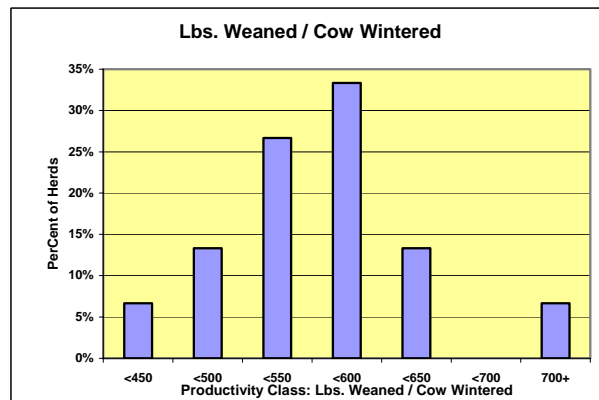
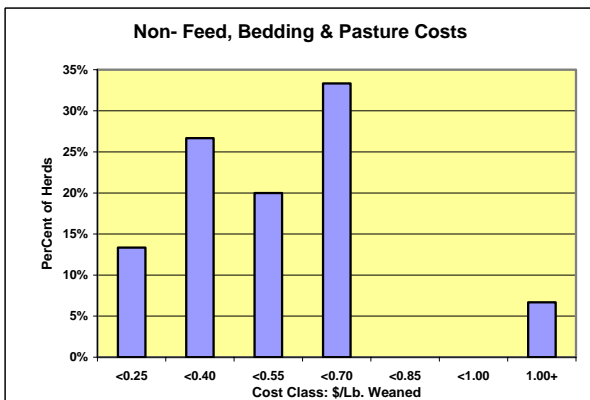
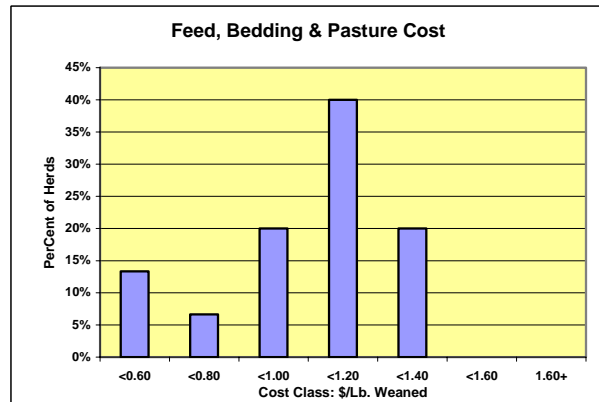
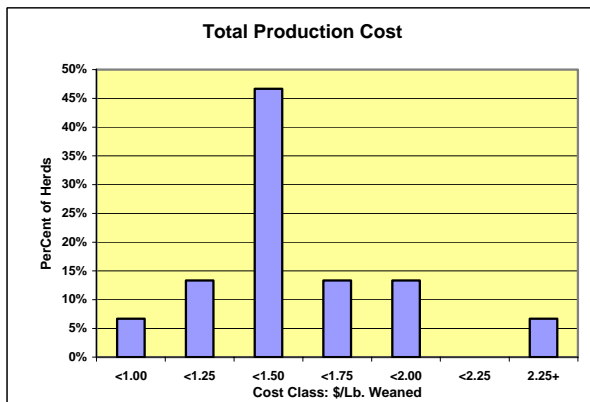
	1998	1999	2000	2001	2002	2003
Calf Crop (%)	84.8	89.3	88.5	84.4	85.9	86.9
Lbs. Weaned/Cow Wintered	518.9	523.1	538.2	503.2	510.1	547.1
Wean Wt as a % of Cow Wt.	43.6	42.4	43.4	43.4	41.5	44.9
Feeding Season Days	183.9	183.9	183.9	189.3	191.3	201.0
Tonnes Fed per Cow (as fed)	5.6	4.6	4.6	5.5	4.6	5.1
Growth (weaning weight)	572.3	564.0	571.8	547.2	528.5	575.0
Open Cows (%)	9.3	6.5	8.4	8.4	9.0	7.6
Length of Calving Period	97.0	91.4	101.9	101.7	110.6	114.9
Death Loss of Calves (%)	2.1	2.6	1.5	3.0	2.7	4.5

Historical Review of Alberta Cow/Calf Operations (cont'd)

Benchmark Comparables: Aspen Parkland, by Year
Enterprise Type: Weaned-Calf



Frequency Distributions: Selected Economic & Production Indicators, Aspen Parkland, 2003



2003 Cow/Calf Enterprise Overview

Economic & Physical Performance Comparisons

Benchmark Comparables: Aspen Parkland Average & Low Cost Groups; Alberta Total

Enterprise Type: Weaned-Calf

Economic Performance Indicators:

	\$ / Lb. Weaned		
	Grass Type	Low Cost	Alberta Total
Production Stock Sales	1.040	1.018	1.062
Value of Production	0.365	0.242	0.509
Winter Feed Costs	0.631	0.636	0.666
Bedding Costs	0.033	0.026	0.046
Pasture Costs	0.297	0.253	0.315
Labour Costs	0.103	0.082	0.121
Other Variable Costs	0.159	0.136	0.186
Depreciation & Capital Lease Payments	0.082	0.072	0.074
Other Fixed Costs	0.034	0.032	0.043
Total Cash Costs	1.174	1.093	1.292
Total Production Costs	1.338	1.237	1.451
Contribution Margin	(0.858)	(0.891)	(0.826)
Gross Margin	(0.809)	(0.851)	(0.783)
Return to Investment	(0.956)	(0.977)	(0.913)
Return to Equity & Management	(0.973)	(0.994)	(0.942)
Total Investment (\$ / cow wintered)	1,629	1,453	1,587

Physical Performance Indicators:

	Grass Type	Low Cost	Alberta Total		Grass Type	Low Cost	Alberta Total
Conception Rate (%)	90.6	91.0	90.7	Cows Wintered	164.8	250.0	194.9
Calving Rate (%)	99.6	99.8	99.1	Cows per Bull	24.2	25.8	26.9
Weaning Rate (%)	96.0	96.8	95.8	Labour Hours per Cow	5.5	4.6	6.0
Calf Crop (%)	86.9	88.1	85.0	AUM's/Cow Wintered	7.9	7.1	7.8
% Calved - 1st 2 Cycles	83.0	84.4	83.6	Feeding Season Days	201.0	213.4	213.2
Lbs. Weaned/Cow Exposed	499.6	507.9	471.4	Tonnes Fed per Cow			
Lbs. Weaned/Cow Wintered	547.1	550.9	527.1	- as-fed	5.1	4.8	4.7
Wean Wt as a % of Cow Wt.	44.9	44.9	43.7	- dry matter			
Weight per Day of Age (lbs.)	2.66	2.68	2.72				

	Grass Type	Low Cost	Alberta Total
G rowth (weaning weight)	575.0	576.6	554.8
O pen Cows (%)	7.6	7.3	9.0
L ength of Calving Period	114.9	124.1	110.6
D eath Loss of Calves (%)	4.5	4.1	4.3

2003 Cow/Calf Enterprise Overview

Economic & Financial Performance Comparisons

Benchmark Comparables: Aspen Parkland Average & Low Cost Groups; Alberta Total

Enterprise Type: Weaned-Calf

Economic Performance Indicators:

	\$ / Cow Wintered		
	Grass Type	Low Cost	Alberta Total
Production Stock Sales	568.93	560.83	559.82
Value of Production	199.46	133.47	268.04
Winter Feed Costs	345.19	350.28	350.96
Bedding Costs	18.19	14.18	24.50
Pasture Costs	162.35	139.56	166.25
Labour Costs	56.16	45.09	63.76
Other Variable Costs	86.98	74.93	97.91
Depreciation & Capital Lease Payments	44.74	39.49	38.80
Other Fixed Costs	18.44	17.70	22.48
Total Cash Costs	642.17	602.01	681.00
Total Production Costs	732.05	681.22	764.66
Contribution Margin	(469.41)	(490.57)	(435.34)
Gross Margin	(442.71)	(468.54)	(412.96)
Return to Investment	(523.29)	(538.47)	(481.05)
Return to Equity & Management	(532.59)	(547.75)	(496.62)

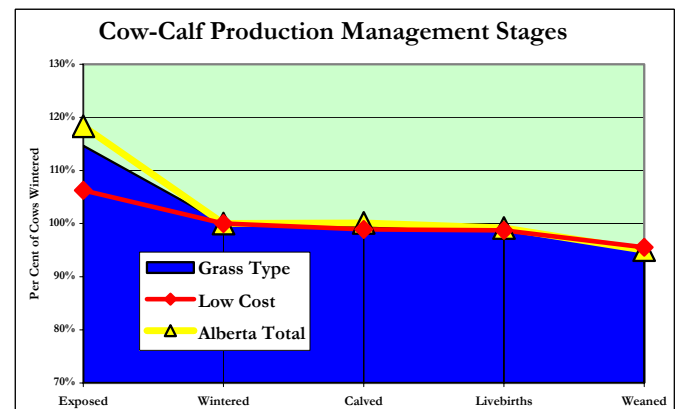
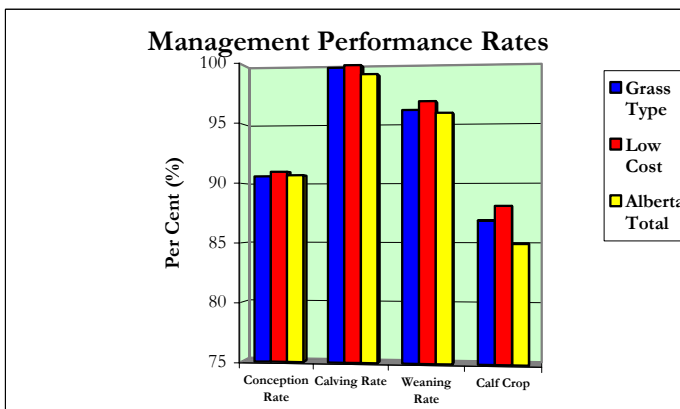
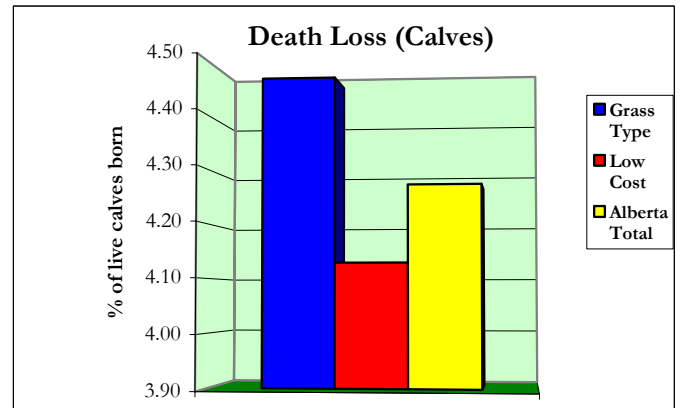
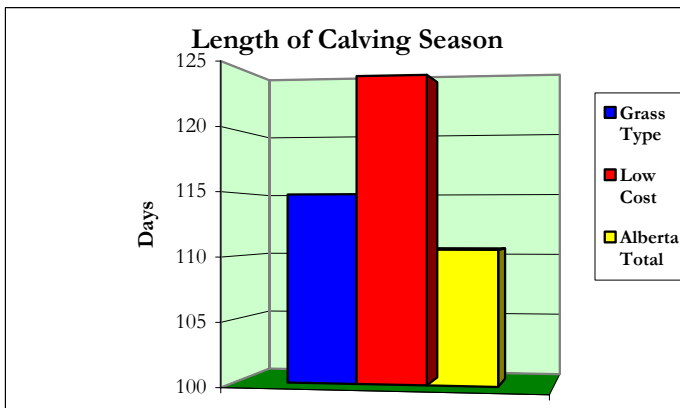
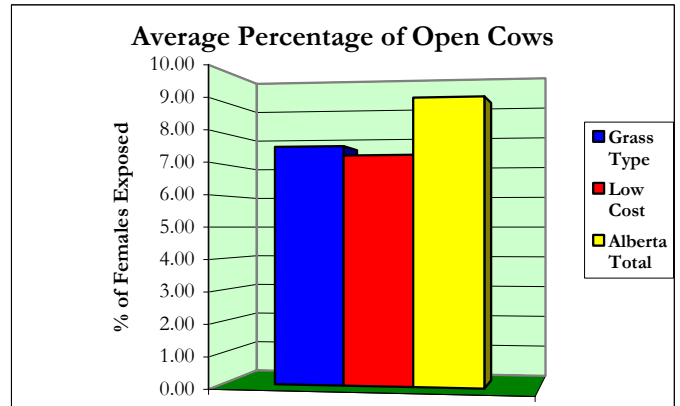
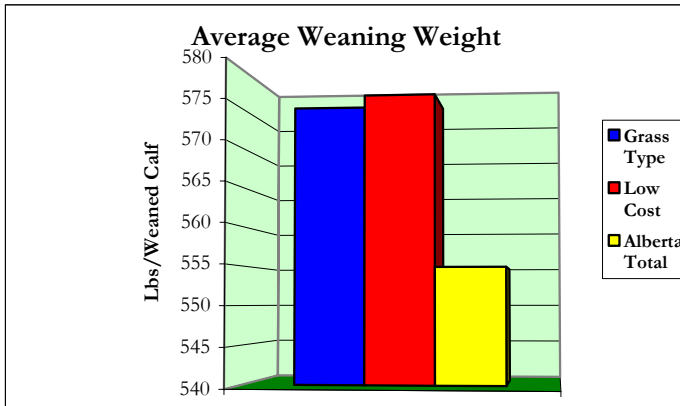
Financial Performance Indicators:

<i>ROAD to Profitability</i>	Grass Type	Low Cost	Alberta Total	
Risk (Debt to Asset Ratio)	0.13	0.12	0.16	= Total Liabilities / Total Assets
Operating Expense Ratio	1.11	1.80	1.32	= Operating Expenses / Value of Production
Asset Return	(0.05)	(0.08)	(0.06)	= Return on Assets / Total Farm Assets
Debt Payout	(3.15)	(1.60)	(3.13)	= Total Liabilities / Net Farm Income
to Profitability	(73,124.85)	(161,254.13)	(100,371.44)	= Net Farm Income
The "3-C's"				
Current Ratio	2.96	3.31	2.22	= Current Assets / Current Liabilities
Calif. Working Cap. Ratio	0.76	0.81	0.69	= Working Capital / Total Expenses
Capital Turnover Ratio	0.09	0.01	0.07	= Value of Production / Total Farm Assets
Farm Size (Acres)	2,783	4,067	4,585	= Total Acres in crops, forages & grazing (includes all acres owned, rented & leased)

2003 Cow/Calf Enterprise Overview

Physical Performance Comparisons

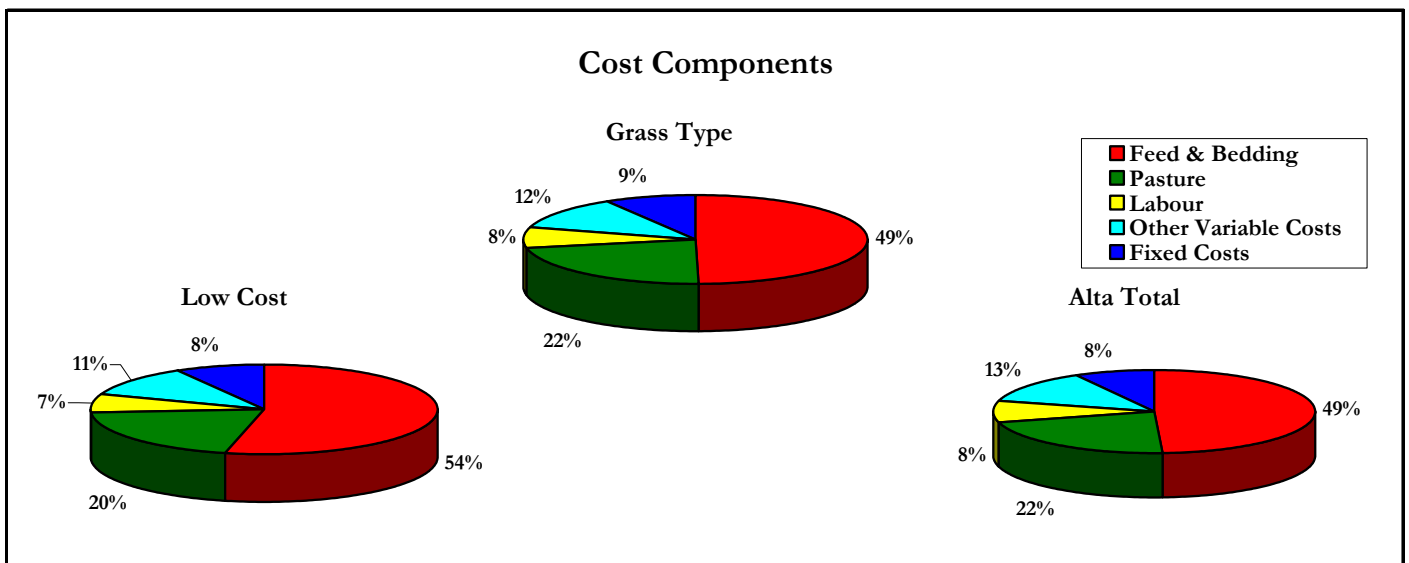
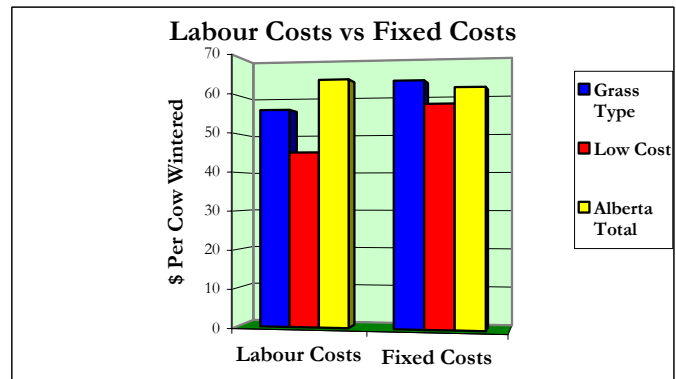
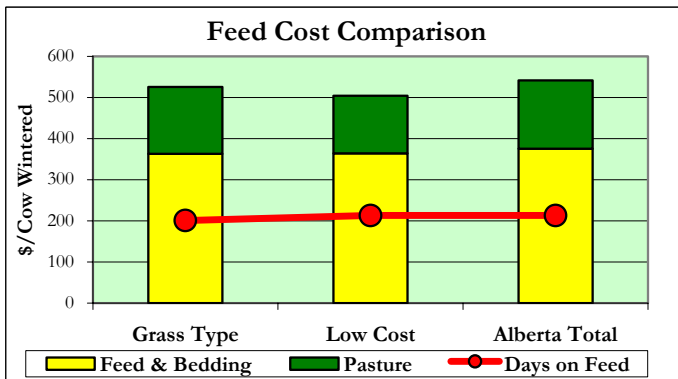
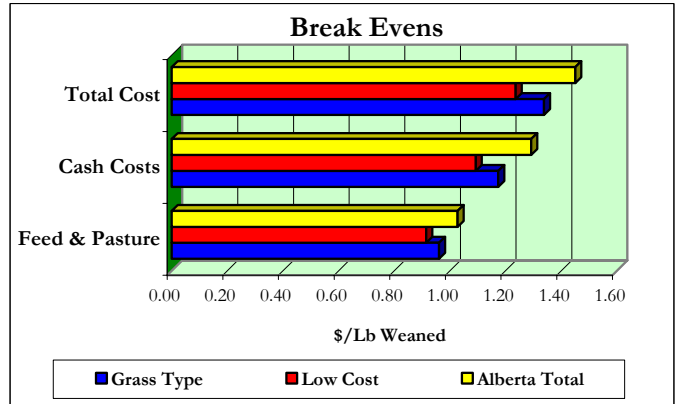
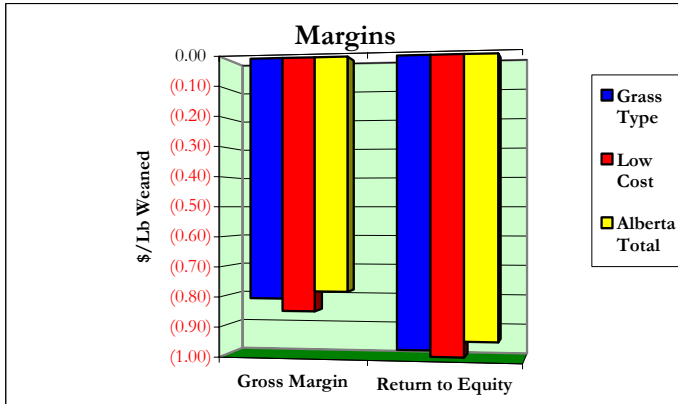
Benchmark Comparables: Aspen Parkland Average & Low Cost Groups; Alberta Total



2003 Cow/Calf Enterprise Overview

Economic Performance Comparisons

Benchmark Comparables: Aspen Parkland Average & Low Cost Groups; Alberta Total



07/14/05

*AgriProfit\$***Cow/Calf Enterprise Unit Cost & Returns Detail - 2003****Economic Performance Comparisons**

	<u>Grass</u>	<u>Low</u>	<u>Alberta</u>
	<u>Type</u>	<u>Cost</u>	<u>Total</u>
	----- \$/Lb Weaned -----		
(A)			
1. Weaned Calves	1.04	1.02	1.06
2. Feeder Calves	0.00	0.00	0.00
3. Slaughter Cattle	0.00	0.00	0.00
4. Purebred Calves	0.00	0.00	0.00
5. Baby Calves	0.00	0.00	0.00
6. Cull Cows/Open Heifers	0.09	0.08	0.08
7. Bulls	0.02	0.01	0.01
8. Bred Cows/Bred Heifers	0.01	0.01	0.01
9. Miscellaneous Receipts	0.00	0.00	0.00
10. Government Programs	0.00	0.00	0.00
11. Inventory Adjustment	(0.47)	(0.56)	(0.30)
12. Less: Cattle Purchases	0.33	0.31	0.36
Value of Production	0.36	0.24	0.51
(B)			
1. Winter Feed	0.63	0.64	0.67
2. Bedding	0.03	0.03	0.05
3. Pasture	0.30	0.25	0.32
4. Veterinary & Medicine	0.04	0.03	0.04
5. Breeding Fees/Bull Rental	0.00	0.00	0.00
6. Trucking & Marketing Charges	0.01	0.00	0.02
7. Fuel	0.02	0.02	0.02
8. Repairs - Machine	0.02	0.01	0.02
9. Repairs - Corrals & Buildings	0.01	0.01	0.01
10. Utilities & Miscellaneous Expenses	0.03	0.03	0.04
11. Custom Work & Specialized Labour	0.01	0.01	0.01
12. Operating Interest Paid	0.01	0.01	0.02
13. Paid Labour & Benefits	0.02	0.01	0.03
14. Unpaid Labour	0.08	0.07	0.09
Variable Costs	1.22	1.13	1.33
(C)			
1. Share/Lease Cattle Payments	0.00	0.00	0.00
2. Taxes, Water Rates, Lic. & Insurance	0.01	0.02	0.01
3. Equipment & Building	0.08	0.07	0.07
a) Depreciation			
b) Lease Payments	0.00	0.00	0.01
4. Paid Capital Interest	0.02	0.02	0.03
Total Capital Costs	0.12	0.10	0.12
(D) Cash Costs (B+C-B14-C3)	1.17	1.09	1.29
(E) Total Production Costs (B+C)	1.34	1.24	1.45
(F) Gross Margin (A-D)	(0.81)	(0.85)	(0.78)
Return to Unpaid Labour (A-D+B14)	(0.89)	(0.92)	(0.85)
Return to Investment (A-E+C4)	(0.96)	(0.98)	(0.91)
Return to Equity (A-E)	(0.97)	(0.99)	(0.94)
Total Investment	2.98	2.64	3.01

07/14/05

AgriProfit®**Cow/Calf Enterprise Unit Cost & Returns Detail - 2003****Economic Performance Comparisons**

	<u>Grass</u>	<u>Low</u>	<u>Alberta</u>
	<u>Type</u>	<u>Cost</u>	<u>Total</u>
	----- \$/Cow Wintered -----		
(A)			
1. Weaned Calves	568.93	560.83	559.52
2. Feeder Calves	0.00	0.00	0.00
3. Slaughter Cattle	0.00	0.00	0.00
4. Purebred Calves	0.00	0.00	0.00
5. Baby Calves	0.00	0.00	0.31
6. Cull Cows/Open Heifers	49.94	43.18	43.18
7. Bulls	9.14	4.91	6.67
8. Bred Cows/Bred Heifers	6.34	3.43	2.64
9. Miscellaneous Receipts	1.75	0.22	1.18
10. Government Programs	0.00	0.00	0.00
11. Inventory Adjustment	(256.30)	(308.45)	(156.67)
12. Less: Cattle Purchases	180.34	170.64	188.78
Value of Production	199.46	133.47	268.04
(B)			
1. Winter Feed	345.19	350.28	350.96
2. Bedding	18.19	14.18	24.50
3. Pasture	162.35	139.56	166.25
4. Veterinary & Medicine	20.38	18.51	19.59
5. Breeding Fees/Bull Rental	0.45	0.35	0.26
6. Trucking & Marketing Charges	4.50	2.06	8.16
7. Fuel	12.59	10.84	12.73
8. Repairs - Machine	12.69	7.82	11.69
9. Repairs - Corrals & Buildings	4.98	4.44	6.82
10. Utilities & Miscellaneous Expenses	18.38	16.14	20.87
11. Custom Work & Specialized Labour	6.54	7.35	6.70
12. Operating Interest Paid	6.47	7.41	11.10
13. Paid Labour & Benefits	10.36	4.96	15.11
14. Unpaid Labour	45.80	40.13	48.65
Variable Costs	668.87	624.04	703.38
(C)			
1. Share/Lease Cattle Payments	1.53	0.00	0.55
2. Taxes, Water Rates, Lic. & Insurance	7.61	8.42	6.36
3. Equipment & Building	44.08	39.09	35.01
a) Depreciation			
b) Lease Payments	0.66	0.40	3.79
4. Paid Capital Interest	9.30	9.28	15.57
Total Capital Costs	63.18	57.19	61.28
(D) Cash Costs	(B+C-B14-C3)	642.17	602.01
(E) Total Production Costs	(B+C)	732.05	681.22
(F) Gross Margin	(A-D)	(442.71)	(468.54)
Return to Unpaid Labour	(A-D+B14)	(486.79)	(507.62)
Return to Investment	(A-E+C4)	(523.29)	(538.47)
Return to Equity	(A-E)	(532.59)	(547.75)
Total Investment		1,628.94	1,453.07
			1,586.76

2003 Forage & Pasture Enterprise Cost & Returns Analysis Aspen Parkland

----- Forages -----				----- Pastures -----		
	Alfalfa /Grass Hay	Mixed Grass Hay	Grain Silage	Tame Grass	Tame /Native Mixed	Native Grassland
Average field size (acres)	78.1	41.3	80.3	126.7	969.2	149.0
Number of Observations	28	10	22	18	10	16
	-----\$/Tonne-----			-----\$/AUM-----		
(A) 1. Crop Sales	66.59	76.97	35.78	21.21	21.69	21.40
2. Crop Insurance Receipts	0.84	0.00	0.10	3.29	1.26	0.46
3. Miscellaneous Receipts	1.50	2.65	0.33	0.72	1.01	0.03
4. Government Programs	0.00	0.00	0.00	0.00	0.00	0.00
5. Straw / Aftermath Grazing	2.29	15.59	0.10	0.00	0.00	0.00
	Gross Return	71.22	95.21	36.31	25.21	23.96
(B) 1. Seed	0.70	0.00	2.59	0.00	0.00	0.00
2. Fertilizer	8.51	12.28	5.01	3.98	0.00	0.63
3. Chemicals	0.42	4.59	2.95	0.00	0.00	0.00
4. Crop Insurance Premiums	1.81	1.46	1.07	0.54	0.20	0.70
5. Trucking & Marketing	0.08	0.52	0.00	0.00	0.00	0.00
6. Fuel	4.89	6.25	2.50	0.72	0.64	0.51
7. Irrigation Fuel & Electricity	0.00	0.00	0.00	0.00	0.00	0.00
8. Repairs - Machinery	6.39	7.15	1.62	0.67	0.40	1.21
9. Repairs - Buildings	0.60	1.66	0.14	0.28	0.56	2.24
10. Utilities & Misc. Expenses	5.69	7.83	1.52	0.64	0.38	0.91
11. Custom Work & Specialized Labour	1.35	3.49	2.57	0.05	0.00	0.00
12. Operating Interest Paid	0.39	2.20	0.30	0.32	0.35	0.18
13. Paid Labour & Benefits	0.33	2.61	0.45	0.11	0.43	0.50
14. Unpaid Labour	7.48	14.56	2.69	0.90	2.03	1.91
	Variable Costs	38.63	64.60	23.42	8.19	4.98
(C) 1. Cash/Share Rent & Land Lease	7.45	15.76	3.08	7.33	4.15	9.45
2. Taxes, Water Rates, Lic. & Insurance	3.43	5.93	0.91	1.20	1.11	1.60
3. Equip. & Bldg. a) Depreciation	13.75	35.93	6.42	1.61	1.09	2.39
b) Lease Payments	0.22	4.39	0.00	0.73	0.06	0.02
4. Paid Capital Interest	5.16	5.65	0.67	1.14	0.19	3.36
	Total Capital Costs	30.00	67.65	11.09	12.00	6.61
(D) Cash Costs (B+C-B14-C3)	47.39	81.76	25.40	17.69	8.46	21.31
(E) Total Production Costs (B+C)	68.62	132.26	34.50	20.20	11.59	25.61
(F) Gross Margin (A-D)	23.83	13.45	10.92	7.53	15.50	0.58
Return to Unpaid Labour (A-E+B14)	10.08	(22.48)	4.50	5.92	14.40	(1.82)
Return to Investment (A-E+C4)	7.76	(31.39)	2.48	6.16	12.56	(0.37)
Return to Equity (A-E)	2.60	(37.04)	1.81	5.02	12.37	(3.73)
Return on Investment (%)	1.1	(3.2)	1.3	1.9	5.3	(0.2)
Total Investment (\$/acre)	1,021.29	751.39	856.54	388.26	130.96	178.93
Management						
Yield per Acre (tonnes or AUM's)	1.43	0.76	4.41	1.22	0.55	0.90
Expected Market Price (\$/unit)	66.59	76.97	35.78	21.21	21.69	21.40

* Cost and returns profiles include/combine all tenure types ... owned, rented & leased.

Definitions & Explanations to Accompany the Cow/Calf Enterprise Overview

Production Stock Sales - revenues associated with the sale of weaned calves & other **non-breeding stock** related sales.

Value of Production (VOP) - the value of what was produced by the cow/calf enterprise over the course of the production year. Includes cash & non-cash values of:

- g** cull & breeding stock sales, revenues from miscellaneous sources (eg. program payments, patronage refunds, etc.) as allocated to the cow/calf enterprise,
- g** inventory adjustments relating changes in the number & value of stock included in the enterprise,
- g** an adjustment for livestock purchases (value is added only from the point of purchase forward)

Winter Feed Costs - the cost of all feeds used by the cow/calf enterprise, purchased or homegrown, based on the market value of these feeds (**not** the cost of raising the feeds).

Pasture Costs - the value of grazing used by the cow/calf enterprise (exclusive of any other retained ownership/backgrounding uses). Pasture is valued into the cow/calf enterprise at market value (**not** cost) & is treated as a "cash" cost.

Labour Costs - a sum of paid & contributed labour, as allocated to the cow/calf enterprise. Paid labour is valued at cost, while unpaid labour is valued at a standard or base cost.

Depreciation & Capital Lease Payments - sum of depreciation & mach./equip't/ bldg. lease payments on assets allocated to the cow/calf enterprise.

Other Fixed Costs - total cash overheads, as allocated to the cow/calf enterprise (share/lease cattle payments, property taxes, insurances, licences & term loan interest).

Total Cash Costs - sum of enterprise cash costs, considering home grown feeds, bedding & pasture as cash costs.

Total Production Costs - sum of all variable & fixed production costs.

Contribution Margin - VOP less Variable Costs

Gross Margin - VOP less Total Cash Costs

Return to Investment - VOP less Total Production Costs plus Term (Capital) Interest Paid

Return to Equity & Management - VOP less Total Production Costs

Investment - sum of assets allocated to the enterprise. includes: breeding stock, machinery, equipment, buildings/facilities & building site (only).

Breeding Performance Rates

(adjusted for sales & purchases of bred cattle)

Conception Rate (%) - # Bred / # Exposed

Calving Rate (%) - # Livebirths / # Bred Females

Weaning Rate (%) - # Weaned / # Livebirths

Calf Crop (%) - # Weaned / # Exposed

Calved in 1st 2 Cycles (%) - $\frac{\# \text{ Calved Cycle 1 \& 2}}{\text{Total Calved}}$

Lbs. Weaned/Cow Exposed - $\frac{\text{Total Lbs. Weaned}}{\# \text{ Females Exposed}}$

Lbs. Weaned/Cow Wintered - $\frac{\text{Total Lbs. Weaned}}{\# \text{ Bred Females Wintered}}$

Wean Wt. as % of Cow Wt. - $\frac{\text{Avg. Lbs. Weaned}}{\text{Avg. Mature Cow Wt.}}$
(adjusting bred heifer wts.)

Weight per Day of Age (lbs.) - $\frac{\text{Avg. Lbs. Weaned}}{\text{Wtd Avg Wean Age}}$

Cows Wintered - Open Inventory of Bred Cows & Heifers

Cows / Bull - # Cows & Heifers Exposed / # Bulls Used

Labour Hours / Cow - Total Labour Hrs. / Cows Wintered

AUM's / Cow Wintered - $\frac{\text{Total Enterprise AUM's}}{\text{Cows Wintered}}$

Feeding Season Days - Days Fed (in yard)

Tonnes Fed per Cow -

as-fed $\frac{\text{Tonnes Total Feed (As-Fed)}}{\# \text{ Cows Wintered}}$

dry matter $\frac{\text{Tonnes Total Feed (Dry Matter)}}{\# \text{ Cows Wintered}}$

GOLD Indicators

Growth (wean wt.) - $\frac{\text{Total Lbs. Weaned}}{\# \text{ Calves Weaned}}$

Open Cows (%) - $\frac{\# \text{ Open Cows \& Heifers}}{\# \text{ Exposed}}$

Length of Calving Period - Days from 1st to last calf

Death Loss of Calves (%) - $\frac{\# \text{ Calves Died}}{\# \text{ Livebirths}}$