

Case Study: Mixed Farm Operation Alternate Scenarios

The Kattel Farm

A fictional Case Study featuring a mixed farm operation owned by Michael and Martha Kattel illustrates the work done by Consultants to complete Farm Business Assessments as offered through the Canadian Farm Business Advisory Services Program under the Renewal Chapter of the Agricultural Policy Framework (APF) - a federal-provincial-territorial initiative.

Every situation and challenge has several possible solutions. The original **Case Study: Mixed Farm Operation** illustrates an action plan based on one scenario. Following are action plans for alternate scenarios.

[Alternate Scenario 2](#) – rent half section

[Alternate Scenario 3](#) – custom grazing cows

[Alternate Scenario 4](#) – cow/calf buying feed

[Alternate Scenario 5](#) – selling and working off farm

Note: This Case Study and alternate scenarios are not a recommendation for a particular course of action. Individual results for farm operators considering these options may vary.

Alternate Scenario 2 – rent half section

The Action Plan

In this scenario, the action plan is to:

- Refinance the new land loan and the new cattle loan over longer terms. For the land loan they decide to look at terming it out over 15 years, 10 years for the cattle loan (as in the original scenario).
- Continue to sell the calves when weaned in late September each year.
- Rent an additional half section of land to grow grain for sale. The additional acreage is premium farmland, and the rental cost would be \$60/acre, 50% due in the spring and 50% due in the fall. In the projections, industry revenues and expense amounts for the area are used.
- Purchase a larger used combine costing \$20,000 net of their trade-in, and finance the purchase over five years. The Kattels currently own a small older combine as little grain is harvested each year. They will still purchase the new baler as per the original plan.
- Martha will take some additional training to improve her skills for her non-farm job utilizing the Canadian Agricultural Skills Services program. Under this program, training is provided at no cost to her. She estimates that when her training is complete in 2008, her net non-farm income after tax will increase to \$30,000/yr.

Operations are projected for 2 years based on this change. The results follow.

After Change Projection (Year 1)				<u>Kattel Farm Income/Expense Summary</u>	
<u>Income (Jan 1 - Dec 31, 2007)</u>				<u>Expenses (Jan 1 - Dec 31, 2007)</u>	
Income				Expense	
Livestock sales				Livestock expense 50,175	
calves	180	x	800	144,000	Cropping expense 109,425
cull cows	35	x	400	14,000	Overhead expense 7,859
repl. hfrs	15	x	900	13,500	Operating interest 814
bulls	4		1,000	4,000	Term interest 32,463
Total				175,500	Total Cash Expense 200,737
Crop sales				Non Cash Expense	
oats	4000	x	2.00	8,000	Depreciation 31,644
barley	6000	x	3.00	18,000	Exp. side acc. adj. 1,904
canola	6750	x	8.00	54,000	Total Non Cash Expense 33,548
Total				80,000	
Other income				Total Accrued Expense 234,285	
Gov't. programs				10,000	Net Accrued Farm Income 54,515
Custom work				5,000	Net wages 20,000
Other				6,800	Living costs 35,000
Total				21,800	Income tax 4,000
Total Cash Income				277,300	Debt Service Capacity 99,622
Inc. side accrual adjustments				11,500	(Net acc. farm inc. + depreciation + term interest + non farm income - living costs - income tax)
Total Accrued Income				288,800	

Profitability Ratios:	
Debt Service Ratio:	1.39
Return on Assets: (see notes below)	2.82%
Return on Equity: (see notes below)	1.45%
Max. operating loan required:	50,132

Payments	
Principal	39,353
Interest	32,463
Total	71,816

Closing Financial Ratios:	
Current Ratio	3.39
Debt to Equity Ratio	0.42
Equity Ratio	0.70

After Change Projection (Year 2) Kattel Farm Income/Expense Summary

Income (Jan 1 - Dec 31, 2008)

Income

Livestock sales				
calves	180	x	800	144,000
cull cows	33	x	400	13,200
repl. hfrs	15	x	900	13,500
bulls	4		1,000	4,000
Total				174,700

Crop sales

oats	4000	x	1.80	7,200
barley	10500	x	3.00	31,500
canola	6750	x	8.00	54,000
Total				92,700

Other income

Gov't. programs				10,000
Custom work				5,000
Other				6,800
Total				21,800

Total Cash Income 289,200

Inc. side accrual adjustments 0

Total Accrued Income 289,200

Expenses (Jan 1 - Dec 31, 2008)

Expense

Livestock expense	49,985
Cropping expense	109,425
Overhead expense	7,859
Operating interest	667
Term interest	32,582

Total Cash Expense 200,519

Non Cash Expense

Depreciation	33,577
Exp. side acc. adj.	481

Total Non Cash Expense 34,058

Total Accrued Expense 234,577

Net Accrued Farm Income 54,623

Net wages 30,000

Living costs 35,000

Income tax 4,000

Debt Service Capacity 111,783

(Net acc. farm inc. + depreciation
+ term interest + non farm income
- living costs - income tax)

Profitability Ratios:

Debt Service Ratio:	1.39
Return on Assets*: (see note)	2.75%
Return on Equity*: (see note)	1.41%
Max. operating loan required:	40,901

Payments

Principal	48,096
Interest	32,582
Total	80,678

Closing Financial Ratios:

Current Ratio	3.80
Debt to Equity Ratio	0.37
Equity Ratio	0.73

Notes on Return on Assets and Equity:

The percentage returns shown above are after living costs are paid. Before living costs, the returns on assets and equity are:

- Return on Assets = 4.50%
- Return on Equity = 3.83%

Some comments about these results are as follows:

1. The additional productivity and income results in an improvement in projected Net Accrued Income from \$28,631 in the projection before the change to \$54,623 in the second year of the plan.
2. Along with the improvement in the net farm income, Martha's net non-farm income is projected to increase by \$10,000. As a result overall Debt Service Capacity is projected to improve from \$73,738/year before the change to \$111,783/year in the second year of the plan.
3. With the refinancing proposed, payments should drop from the \$110,477 projected before the change. Additional debt will be incurred in this Scenario for the purchase of a combine resulting in Year 2 payments of \$80,678 and a Debt Service Ratio (the relationship of payment capacity to payment requirement) of 1.39, a ratio that is generally considered to be acceptable.
4. Operating loan requirements in this Scenario will increase significantly during the operating season due to the additional crop inputs required. Maximum operating loan requirements are projected to be \$50,132 in Year 1 and \$40,901 in Year 2 of the plan.

[Back to the TOP](#)

Alternate Scenario 3 – custom grazing cows

The Action Plan

In this Scenario, the action plan is to change enterprises from a cow/calf enterprise where all feed is produced and calves are sold in the fall, to a grazing operation where cow/calf units are grazed on a custom basis. The action plan is as follows.

- Calve out, and continue to feed the owned cows until about May 1, then sell as cow/calf pairs.
- After the cows are sold, disperse of any surplus feed.
- In the spring, sell equipment no longer needed for this operation (\$192,000 of the present \$339,200 line of equipment).
- Sell the grazing lease in the spring for \$160,000.
- Seed the remaining crop land to pasture at a cost of about \$5,000.
- Spend about \$10,000 to improve fences.
- For future operations, custom graze all the cultivated land for approximately four months per year.
- Proceeds from the sale of assets will be used to pay off debt. Surplus funds of about \$180,000 will be put into an investment expecting to return 5%/yr. Thereafter, surplus cash will be invested as it becomes available.
- Michael and Martha will take some additional training to improve their skills for non-farm jobs utilizing the Canadian Agricultural Skills Services program. Under this program, training is provided at no cost to them. Michael thinks he should then be able to get winter work and earn about \$20,000/yr., net after tax. Martha estimates that when her training is complete in 2008, her net non-farm income after tax will increase to \$30,000/yr.

Operations are projected for 2 years based on this change. The results follow.

After Change Projection (Year 1) Kattel Farm Income/Expense Summary

Income (Jan 1 - Dec 31, 2007)

Income

Livestock sales			
calves	24	x	800
			19,200
cow/calf pairs	248	x	1,200
			297,600
repl. hfrs	50	x	900
			45,000
bulls	10		500
			5,000
Total			366,800

Crop sales

surplus crops			20,600
pasture	770	x	80
			61,600
Total			82,200

Other income

Gov't. programs			10,000
Custom work			5,000
Other			6,800
Total			21,800

Total Cash Income

470,800

Inc. side accrual adjustments

-291,440

Total Accrued Income

179,360

Expenses (Jan 1 - Dec 31, 2007)

Expense

Livestock expense	25,500
Cropping expense	42,400
Overhead expense	7,859
Operating interest	0
Term interest	13,566

Total Cash Expense

89,325

Non Cash Expense

Depreciation	18,072
Exp. side acc. adj.	47,349

Total Non Cash Expense

65,421

Total Accrued Expense

154,746

Net Accrued Farm Income

24,614

Net wages	20,000
Living costs	35,000
Income tax	20,000

Debt Service Capacity

21,252

(Net acc. farm inc. + depreciation
+ term interest + non farm income
- living costs - income tax)

Profitability Ratios:

Debt Service Ratio:	1.57
Return on Assets (see note below):	0.08%
Return on Equity (see note below):	-0.83%
Max. operating loan required:	0

Payments

Principal	0
Interest	13,566
Total	13,566

Closing Financial Ratios:

Current Ratio	(N/A)	No debt
Debt to Equity Ratio		0.00
Equity Ratio		1.00

After Change Projection (Year 2)

Kattel Farm Income/Expense Summary

Income (Jan 1 - Dec 31, 2008)

Income

Livestock sales				
calves	0	x	0	0
cull cows	0	x	0	0
repl. hfrs	0	x	0	0
bulls	0		0	0
Total				0

Crop sales

pasture	870	x	80	69,600
				0
Total				69,600

Other income

Gov't. programs				2,000
Custom work				5,000
Other				6,800
Total				13,800

Total Cash Income

83,400

Inc. side accrual adjustments

0

Total Accrued Income

83,400

Expenses (Jan 1 - Dec 31, 2008)

Expense

Livestock expense	0
Cropping expense	44,400
Overhead expense	5,684
Operating interest	68
Term interest	0

Total Cash Expense

50,152

Non Cash Expense

Depreciation	15,363
Exp. side acc. adj.	0

Total Non Cash Expense

15,363

Total Accrued Expense

65,515

0

Net Accrued Farm Income

17,885

Interest on investment 9,000

Net wages 50,000

Living costs 35,000

Income tax 6,500

Debt Service Capacity

50,748

(Net acc. farm inc. + depreciation
+ term interest + non farm income
- living costs - income tax)

Profitability Ratios:

Debt Service Ratio:	No debt
Return on Assets* (see note):	-1.33%
Return on Equity* (see note):	-1.34%
Max. operating loan required:	11,300

Payments

Principal	0
Interest	0
Total	0

Closing Financial Ratios:

Current Ratio	No debt
Debt to Equity Ratio	0.00
Equity Ratio	1.00

*Notes on Return on Assets and Equity:

The percentage returns shown above are before interest income and after living costs are paid. Before living costs, the returns on assets and equity (farm and investment) are:

- Return on Assets = 2.03%
- Return on Equity = 2.02%

Some comments about these results are as follows:

1. The sell off of assets in this plan allows for all debt to be repaid, and leaves \$180,000 to invest. Projected return of 5% results in additional net income of \$9,000 per year from that source. In the plan, payments after the changes are complete are essentially \$0.
2. Transition from the present operation to the proposed operation is expected to bear some cost in terms of lost productivity in the change year some set up costs, and tax liability. Profitability from farm operations decreases from \$28,631 in the projection before the change to \$17,885 in the second year of the plan.
3. The reduction in farm operations means that both Michael and Martha will be able to have non-farm jobs. They anticipate that net non-farm income after tax for them together will increase from \$20,000/year to about \$50,000. As deductible farm expenses will be significantly reduced, income tax payable on net farm income and investment income is expected to increase from \$4,000 per year to about \$6,500 per year.
4. Cash flow in this plan should be very strong. The farm is projected to be profitable, non farm income will exceed living costs and income tax, and there will be income from the cash investment. The result is surplus cash that could be invested, or spent on items of personal interest.

[Back to the TOP](#)

Alternate Scenario 4 – cow/calf buying feed

The Action Plan

In this Scenario, the action plan is to continue with the cow/calf enterprise where calves are sold in the fall. A change is made to purchase the feed required rather than growing it. The action plan is as follows:

- In the spring, sell equipment no longer needed for this operation (\$192,000 of the present \$339,200 line of equipment).
- Use the proceeds from the sale of equipment to reduce debt.
- Terminate the lease on the privately rented land.
- Purchase all feed required.
- Rent out surplus land.
- Michael and Martha will take some additional training to improve their skills for non-farm jobs utilizing the Canadian Agricultural Skills Services program. Under this program, training is provided at no cost to them. Michael thinks he should then be able to get part time work and earn about \$10,000/yr., net after tax. Martha estimates that when her training is complete in 2008, her net non-farm income after tax will increase to \$30,000/yr.

Operations are projected for 2 years based on this change. The results follow.

After Change Projection (Year 1)**Kattel Farm Income/Expense Summary****Income (Jan 1 - Dec 31, 2007)****Income**

Livestock sales				
calves	180	x	800	144,000
cull cows	35	x	400	14,000
repl. hfrs	15	x	900	13,500
bulls	4		1,000	4,000
Total				175,500

Crop sales

surplus crops				3,600
pasture	0	x	0	0
Total				3,600

Other income

Gov't. programs				10,000
Custom work				5,000
Land Rent & Other				26,000
Total				41,000

Total Cash Income 220,100**Inc. side accrual adjustments** -5,600**Total Accrued Income** 214,500**Expenses (Jan 1 - Dec 31, 2007)****Expense**

Livestock expense	132,075
Cropping expense	1,150
Overhead expense	7,859
Operating interest	0
Term interest	24,765

Total Cash Expense 165,849**Non Cash Expense**

Depreciation	18,072
Exp. side acc. adj.	-772

Total Non Cash Expense 17,300**Total Accrued Expense** 183,150**Net Accrued Farm Income** 31,350

Net wages 20,000

Living costs 35,000

Income tax 3,000

Debt Service Capacity 56,188(Net acc. farm inc. + depreciation
+term interest + non farm income
- living costs - income tax)**Profitability Ratios:**

Debt Service Ratio:	1.23
Return on Assets (see note below):	1.23%
Return on Equity (see note below):	-0.28%
Max. operating loan required:	0

Payments

Principal	21,029
Interest	24,765
Total	45,794

Closing Financial Ratios:

Current Ratio	9.91
Debt to Equity Ratio	0.25
Equity Ratio	0.80

After Change Projection (Year 2)**Kattel Farm Income/Expense Summary****Income (Jan 1 - Dec 31, 2008)****Income**

Livestock sales				
calves	180	x	800	144,000
cull cows	33	x	400	13,200
repl. hfrs	15	x	900	13,500
bulls	4		1,000	4,000
Total				174,700

Crop sales

surplus crops				0
pasture	0	x	0	0
Total				0

Other income

Gov't. programs				10,000
Custom work				5,000
Land Rent & Other				26,000
Total				41,000

Total Cash Income 215,700**Inc. side accrual adjustments** 0**Total Accrued Income** 215,700**Expenses (Jan 1 - Dec 31, 2008)****Expense**

Livestock expense	131,885
Cropping expense	1,150
Overhead expense	7,859
Operating interest	0
Term interest	18,944
Total Cash Expense	159,838

Non Cash Expense

Depreciation	15,063
Exp. side acc. adj.	-54
Total Non Cash Expense	15,009

Total Accrued Expense 174,847**Net Accrued Farm Income** 40,853

Net wages	40,000
Living costs	35,000
Income tax	4,000

Debt Service Capacity 75,860(Net acc. farm inc. + depreciation
+ term interest + non farm income
- living costs - income tax)**Profitability Ratios:**

Debt Service Ratio:	2.33
Return on Assets* (see note):	1.43%
Return on Equity* (see note):	0.43%
Max. operating loan required:	0

Payments

Principal	13,603
Interest	18,944
Total	32,547

Closing Financial Ratios:

Current Ratio	12.21
Debt to Equity Ratio	0.23
Equity Ratio	0.81

Notes on Return on Assets and Equity:The percentage returns shown above are after living costs are paid. Before living costs, the returns on assets and equity are:*

- o *Return on Assets = 3.43%*
- o *Return on Equity = 2.91%*

Some comments about these results are as follows:

1. The Kattel's have always wondered if they would be better off purchasing their feed rather than producing it. In this option, they sell the equipment they no longer need, give up the rented land and rent out surplus land. Debt is significantly reduced with this change, and leverage and equity ratios also improve.
2. Profitability from farm operations improves from \$28,631 in the projection before the change to \$40,853 in the second year of the plan
3. The change means that both Michael and Martha will be able to have non-farm jobs. They anticipate that Michael will now earn about \$10,000 after tax from non farm income in addition to Martha's projected \$30,000 in the second year of the plan.
4. Cash flow in this plan should be very strong. No operating funding should be required in the second year of the plan, and surplus cash from farm and non-farm sources should be available for investment into non-farm investments or further reduction of debt.

[Back to TOP](#)

Alternate Scenario 5 – selling and working off farm

The Action Plan

In this Scenario, the action plan is to terminate farm operations, sell livestock and equipment and rent the land out. Michael and Martha would both obtain full time non-farm employment. The action plan is as follows.

- Calve out, and continue to feed the owned cows until about May 1, then sell as cow/calf pairs.
- After the cows are sold, disperse any surplus feed.
- In the spring, sell all equipment except the front-end loader tractor, the quad, tools, and the farm pickup trucks. Total proceeds from the sale are projected to be \$261,300.
- Sell the grazing lease in the spring for \$160,000.
- Use the proceeds from the sale of equipment, livestock and grazing lease to retire debt. Surplus funds of about \$250,000 would be put into an investment expected to return 5%
- Terminate the lease on the privately rented land.
- Rent all the land.
- Michael and Martha would take some additional training to improve their skills for non-farm jobs utilizing the Canadian Agricultural Skills Services program. Under this program, training is provided to them at no cost. Michael thinks he should then be able to get full time work and earn about \$30,000/yr., net after tax. Martha estimates when her training is complete in 2008, her net non-farm after tax income would increase to \$30,000/yr. as well.

Operations are projected for 2 years based on this change. The results follow.

After Change Projection (Year 1)**Kattel Farm Income/Expense Summary****Income (Jan 1 - Dec 31, 2007)****Income**

Livestock sales				
calves	24	x	800	19,200
cow/calf pairs	248	x	1,200	297,600
repl. hfrs	50	x	900	45,000
bulls	10		500	5,000
Total				<u>366,800</u>

Crop sales

surplus crops				20,600
other				0
Total				<u>20,600</u>

Other income

Gov't. programs				5,000
Custom work				0
Land Rent & Other				<u>27,800</u>
Total				<u>32,800</u>

Total Cash Income 420,200**Inc. side accrual adjustments** -291,440**Total Accrued Income** 128,760**Expenses (Jan 1 - Dec 31, 2007)****Expense**

Livestock expense	25,500
Cropping expense	0
Overhead expense	4,884
Operating interest	0
Term interest	13,566

Total Cash Expense 43,950**Non Cash Expense**

Depreciation	11,286
Exp. side acc. adj.	47,349

Total Non Cash Expense 58,635**Total Accrued Expense** 102,585**Net Accrued Farm Income** 26,175

Net wages 20,000

Living costs 35,000

Income tax 20,000

Debt Service Capacity 16,027(Net acc. farm inc. + depreciation
+ term interest + non farm income
- living costs - income tax)**Profitability Ratios:**

Debt Service Ratio:	1.18
Return on Assets (see note below):	0.21%
Return on Equity (see note below):	-0.71%
Max. operating loan required:	0

Payments

Principal	0
Interest	13,566
Total	<u>13,566</u>

Closing Financial Ratios:

Current Ratio	N/A	No debt
Debt to Equity Ratio		0.00
Equity Ratio		1.00

After Change Projection (Year 2)

Kattel Farm Income/Expense Summary

Income (Jan 1 - Dec 31, 2008)

Income

Livestock sales				
calves	0	x	0	0
cull cows	0	x	0	0
repl. hfrs	0	x	0	0
bulls	0		0	0
Total				0

Crop sales

crops				0
Total				0

Other income

Gov't. programs				0
Custom work				0
Land Rent & Other				28,800
Total				28,800

Total Cash Income 28,800

Inc. side accrual adjustments 0

Total Accrued Income 28,800

Expenses (Jan 1 - Dec 31, 2008)

Expense

Livestock expense	0
Cropping expense	0
Overhead expense	8,884
Operating interest	38
Term interest	0

Total Cash Expense 8,922

Non Cash Expense

Depreciation	10,062
Exp. side acc. adj.	0

Total Non Cash Expense 10,062

Total Accrued Expense 18,984

Net Accrued Farm Income 9,816

Interest on investment	12,500
Net wages	60,000
Living costs	40,000
Income tax	5,500

Debt Service Capacity 46,878

(Net acc. farm inc. + depreciation
+ term interest + non farm income
- living costs - income tax)

Profitability Ratios:

Debt Service Ratio:	N/A	No debt
Return on Assets* (see note):		-2.35%
Return on Equity* (see note):		-2.35%
Max. operating loan required:		0

Payments

Principal	0
Interest	0
Total	0

Closing Financial Ratios:

Current Ratio	N/A	No debt
Debt to Equity Ratio		0.00
Equity Ratio		1.00

***Notes on Return on Assets and Equity:**

The percentage returns shown above are before interest income after living costs are paid. Before living costs, the returns on assets and equity (farm and investment) are:

- *Return on Assets = 1.68%*
- *Return on Equity = 1.68%*

Some comments about these results are as follows:

1. The sell off of assets in this plan allows for all debt to be repaid, and leaves \$250,000 to invest. Projected return of 5% results in additional net income of \$12,500 per year. In the plan, payments after the changes are complete are essentially \$0.
2. Transition from the present operation to the proposed operation is expected to bear some cost in terms of lost productivity in the change year, some set up costs, and tax liability.
3. Profitability from farm operations decreases from \$28,631 in the projection before the change to \$9,816 in the second year of the plan. In addition, there is interest income as noted above.
4. The termination of farm operations means that both Michael and Martha will be able to have full time non-farm jobs. They anticipate that net non-farm income after tax for them together will increase from \$20,000/year to about \$60,000 in the second year, after they have updated their employment skills. Income tax payable on net farm and investment income is expected to increase from \$4,000 per year to about \$5,500 per year. With the higher levels of non-farm employment, they expect living costs to increase slightly.
5. Cash flow in this plan should be very strong. The farm is projected to be profitable, non farm income will exceed living costs and income tax, and there will be income from the cash investment. The result is surplus cash that could be invested, or spent on items of personal interest.

Summary

Four alternative scenarios have been developed for the **Case Study: Mixed Farm Operation**. Each Scenario has it's own individual results as well as positive and negative features as detailed in the **Comparison Chart**. The financial ratios and indicators for each scenario should be considered relative to the business and personal goals of the Case Study Farmers.

Note: The purpose of this Case Study is not to recommend a particular course of action. Individual results of farm operators considering these options may vary.

[Back to TOP](#)