Business Planning and Economics of Sheep Farm Establishment and Cost of Production in Nova Scotia

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Introduction

The sheep industry is well established in Nova Scotia. Nova Scotia sheep producers have been leaders in importation of breeding stock and marketing for many years. With the increase in demand for lamb nationally and the availability of suitable land in Nova Scotia, there is a real opportunity for the expansion of the province's sheep industry. To be successful in the sheep industry it is imperative that sound business decisions are made from the initial planning through to the marketing and selling of the lamb, wool or milk produced. Like any farm operation, there is a significant investment of capital required for the establishment of a sheep farm, either as a stand-alone operation or as an opportunity to diversify an existing farm. It is essential for financial success that the flock be operated as a business enterprise, paying great attention to detail in both production and financial management.

The Nova Scotia Industry

The early settlers in Nova Scotia recognized the opportunity to raise sheep in this province. These sheep were the first domesticated livestock in Canada. Currently, there are approximately 350 sheep producers in the province, with approximately 14,700 ewes and rams. The sheep numbers have been stable for the last 10 years, showing a slight increase in recent years.

There are relatively few large flocks; only a couple of producers have over 400 ewes and 10 producers have 200 to 300 ewes. The average flock size is estimated to be between 45 and 50 ewes. The majority of the producers choose to lamb in late winter or spring, with only a couple producers choosing accelerated lambing. The lambs are primarily marketed to processors in Nova Scotia, with the three largest processors marketing approximately 80% of the lambs produced. There is considerable interest in value-added wool production and processing for the craft market. Also, there is interest in dairy sheep where the milk will be processed into cheese and yogurt.

Objectives

The purpose of this report is to provide individuals interested in establishing a sheep farm a guide to the development of a plan and an understanding of the costs associated with the establishment and operation of a commercial sheep farm. The report reflects the management practices of producers in Nova Scotia at the present time and the current economic conditions that can influence the establishment and operating costs. The costs in this document represent an average scenario for producers who spring lamb; expenses will vary depending on the producer and their management decisions.

Methods and Procedures

The information presented in this report was gathered through economic reports and tools from other sheep producing regions in Canada and the United States, online and printed resources, and discussions with Nova Scotia producers, specialists and agribusinesses.

Overview of Sheep Farm Establishment

In the sheep farm business, returns are a function of costs (capital and operating) and revenue, which is a function of producer's management skills, flock productivity and market price.

The costs associated with establishing and operating a sheep farm will vary from operation to operation due to the significant differences in management practices. Management practices include decisions such as what time of the year to lamb, type of fencing, how to protect the flock against predators, and forage and grain to feed the flock. A new sheep farmer or someone considering entry into sheep production must carefully consider the advantages and disadvantages of each management practice because these decisions will have a considerable impact on the profitability of the sheep operation.

Sheep producers in Nova Scotia have experienced relatively stable pricing for their lambs. This is due in part to a well established marketing system that has developed over the past 30 years. Based on market and production trends and an increasing demand for lamb, it is anticipated that the market will remain stable in the foreseeable future.

Management Practices – Lambing Systems

The success of a sheep farm is directly related to the management of the flock and the operation itself. A key component of the management of the flock is the *lambing system* that is chosen. A lambing system that has been poorly selected or managed can result in limitations to the long term financial viability of the operation.

Three common lambing systems:

Spring Lambing takes place in April/May and is a once a year system. Lambing in the spring allows the producer to synchronize the production cycle with the forage production cycle to maximize the utilization of pasture and stored forage and reduce feed costs, labour costs and overhead costs.

Winter Lambing takes place between December and March and is also a once a year system. Lambing in the winter allows the producer to take advantage of the potential for high value market opportunities.

Accelerated Lambing takes place on an 8 month cycle, with the ewes lambing three times in two years, or 1.5 times per ewe per year. Lambing more than once a year allows the producer to increase revenue by reducing fixed costs per lambing, increasing over-all production, and marketing year round.

Table 1 lists the advantages and disadvantages of each lambing system. There is no best lambing system or way to raise sheep; producers need to select the lambing system that best suits their goals/objectives, farm resources, and marketing opportunities.

Table 1: Advantages and Disadvantage of Lambing Systems

	Advantages	**Disadvantages**
Spring Lambing	- Lower feed costs - Lower housing costs - Lower capital investments - Reduced labour requirement - Lambing in warm weather	- Greater market competition - Increase in de-worming costs - Increase in predation risk
Winter Lambing	- Increase in marketing opportunities - More control of nutritional intake - Decreased exposure to parasites - Decrease in predation	- Higher feed costs - Higher capital investment (e.g. barn requirement) - Increase in housing costs (e.g. electricity) - Increase in health problems - Increase in labour requirements
Accelerated Lambing	- More lamb marketed per ewe - Opportunity to market year round and target high value markets - Reduce risk of hitting low value markets - More efficient utilization of capital resources	- Management is more intensive - Higher feed cost/ewe/year - Possibility of higher culling rate

Breeds of Sheep

There are over 49 recognized breeds of sheep in Canada and over 1000 breeds in the world. In Nova Scotia, the most common breeds raised are: Suffolk, Dorset, North Country Cheviot, and Rideau ARCOTT. Matching the breed of sheep to the lambing system is vital to ensure the success and profitability of the operation. For example, North Country Cheviot ewes are best suited to extensive spring lambing, whereas for accelerated lambing programs, Dorsets or Rideau ARCOTTs would be a better choice.

The Model

In Nova Scotia, the most common lambing system is spring lambing, timed to maximize the utilization of pasture. For the purpose of this report, a spring lambing system has been analyzed, however, it should be noted that costs associated with various lambing systems and management practices will vary significantly. This report analyzes the establishment costs, costs of production, and break even years on the initial investment of a 400 ewe flock. Two scenarios will be modeled for such an operation, the difference between the scenarios being the number of years to build a flock of 400 ewes.

Scenario 1

- The producer purchases 100 ewes in Year 1 and builds to 400 ewes over five years
- The producer builds the flock by retaining the maximum number of available ewe lambs produced on the farm up to Year 5
- Establishment costs are spread over five years as the infrastructure required to accommodate the flock increases
- It is assumed that 50% of the lambs born each year are female
- Replacement ewes are retained from the lambs born each year at a rate equal to 20% of the ewe flock
- Establishment costs for Year 1 are borrowed and repayment starts in Year 2; the establishment costs for Years 2-5 are not borrowed

Scenario 2

- The producer purchases 400 ewes in Year 1
- Establishment costs occur in full in Year 1
- It is assumed that 50% of the lambs born each year are female
- Replacement ewes are retained from the lambs born each year at a rate equal to 20% of the ewe flock
- Establishment costs for Year 1 are borrowed and repayment starts in Year 2

Establishment, Cost of Production & Operational Assumptions

- Legal, office, and general maintenance costs are not included
- All loans are borrowed at a fixed rate of 6.95% for 25 years, based on Farm Loan Board rates
- The cost of land is excluded from the analysis
- The land is cleared and producing forage
- The land has a barn structure in place suitable for housing sheep
- Carrying capacity of land is assumed to be 4 ewes per acre (100 acres for 400 ewes)
- The flock purchased in Year 1 is an operational flock, consisting of various aged ewes
- The lambing percentage is 150% in Year 1 and increases by 5% each year until Year 7 when it reaches 180% and will remain at 180%
- Ewe lambs that were retained for replacement and/or expansion from the previous year only lamb at 80%
- Guardian dogs are used to protect the flock against predators; approximately 1 guardian dog per 100 ewes
- Fencing costs are based on establishing a new 5-strand electric fence
- All stored forage for winter feeding is purchased
- Market price is based on current economic conditions and assumed to be an average of the yearly market fluctuations

Costs and Returns of Sheep Production

Establishment Costs

Establishment costs are those costs that are associated with the establishment of a new or transitioning operation. Examples of establishment costs include: ewe and ram purchases, fencing costs, watering system, pasture establishment, and handling equipment.

Variable Costs

Variable costs are those costs that change directly with an increase or decrease in flock size. Feed and mineral, vet costs, marketing, and labour are all examples of variable costs.

Fixed Costs

Fixed costs or overhead costs do not change as a result of an increase or decrease in acreage. Examples of fixed costs include land taxes and machinery depreciation.

Year 1

In Year 1, Scenario 1 purchases only 100 ewes and only incurs a portion of its establishment costs. Scenario 2 purchases 400 ewes and incurs the entire establishment costs associated with a 400 ewe flock operation. Despite the higher cost of establishment for Scenario 2, the cost per ewe is significantly less than for Scenario 1 because of the number of ewes in production.

Table 2: Year 1 Costs

YEAR 1	Scenario 1 100 Ewes	Scenario 1 Per Ewe	Scenario 2 400 Ewes	Scenario 2 Per Ewe
Establishment Costs	$49,000	$490	$143,600	$359
Variable Costs	$18,820	$188	$69,490	$174
Fixed Costs	$4,000	$40	$4,000	$10
Total Costs	$71,820	$718	$217,090	$543
Total Revenue	$12,306	$123	$82,224	$206
Total Revenue – Total Cost	-$59,514	-$595	-$134,866	-$337

Years 2-4

In Years 2-4, the flock in Scenario 1 is continuing to expand. The establishment costs for Scenario 1 are relatively stable throughout these years, but the establishment cost per ewe decreases as the ewe flock increases. Scenario 1 does not see a positive return on the flock until Year 4. On the other hand, Scenario 2 does not have any establishment costs and will see a positive return on the flock in Year 2.

Table 3: Year 2 Costs

YEAR 2	Scenario 1 155 Ewes	Scenario 1 Per Ewe	Scenario 2 400 Ewes	Scenario 2 Per Ewe
Establishment Costs	$9,400	$61	$0	$0
Variable Costs	$27,735	$179	$69,470	$174
Fixed Costs	$3,400	$22	$3,400	$9
Total Costs	$40,535	$262	$72,870	$182
Total Revenue	$17,762	$115	$76,294	$191
Total Revenue – Total Cost	$22,773	-$147	$3,424	$9

Table 4: Year 3 Costs

YEAR 3	Scenario 1 232 Ewes	Scenario 1 Per Ewe	Scenario 2 400 Ewes	Scenario 2 Per Ewe
Establishment Costs	$9,900	$43	$0	$0
Variable Costs	$40,178	$173	$70,378	$176
Fixed Costs	$2,920	$13	$2,920	$7
Total Costs	$52,998	$228	$73,298	$183
Total Revenue	$23,846	$103	$78,764	$197
Total Revenue – Total Cost	-$29,152	-$125	$5,466	$14

Table 5: Year 4 Costs

YEAR 4	Scenario 1 327 Ewes	Scenario 1 Per Ewe	Scenario 2 400 Ewes	Scenario 2 Per Ewe
Establishment Costs	$9,400	$29	$0	$0
Variable Costs	$56,631	$173	$71,136	$178
Fixed Costs	$2,536	$8	$2,536	$6
Total Costs	$68,567	$210	$73,672	$184
Total Revenue	$45,731	$140	$81,234	$203
Total Revenue – Total Cost	-$22,836	-$70	$7,562	$19

Year 5 and Beyond

Year 5 is the last year that Scenario 1 will pay establishment costs; it is in this year that Scenario 1 will reach 400 ewes in its operation. In Year 6 and beyond, the total costs are the same for both scenarios with the exception that under the variable costs, every 5 years a guard dog is not purchased in Scenario 1. Both scenarios should reach a lambing percentage of 180% in Year 7, thus total costs and total revenue should be the same for both scenarios, aside from the exception mentioned above.

Table 6: Year 5 Costs

YEAR 5	Scenario 1 400 Ewes	Scenario 1 Per Ewe	Scenario 2 400 Ewes	Scenario 2 Per Ewe
Establishment Costs	$5,900	$15	$0	$0
Variable Costs	$69,755	$174	$71,544	$179
Fixed Costs	$2,229	$6	$2,229	$6
Total Costs	$77,884	$195	$73,773	$184
Total Revenue	$75,833	$190	$83,634	$209
Total Revenue – Total Cost	-$2,051	-$5	$9,861	$25

Table 7: Year 6 Costs

YEAR 6	Scenario 1 400 Ewes	Scenario 1 Per Ewe	Scenario 2 400 Ewes	Scenario 2 Per Ewe
Establishment Costs	$0	$0	$0	$0
Variable Costs	$71,968	$180	$71,952	$180
Fixed Costs	$1,983	$5	$1,983	$5
Total Costs	$73,951	$185	$73,935	$185
Total Revenue	$86,128	$215	$86,034	$215
Total Revenue – Total Cost	$12,177	$30	$12,099	$30

Table 8: Year 7 Costs

YEAR 7	Scenario 1 400 Ewes	Scenario 1 Per Ewe	Scenario 2 400 Ewes	Scenario 2 Per Ewe
Establishment Costs	$0	$0	$0	$0
Variable Costs	$72,360	$181	$72,360	$181
Fixed Costs	$1,786	$4	$1,786	$4
Total Costs	$74,146	$185	$74,146	$185
Total Revenue	$88,434	$221	$88,434	$221
Total Revenue – Total Cost	$14,288	$36	$14,288	$36

Treatment of Establishment Costs

The model used in this report has the producer establishing their sheep farm and generating income in the first year. In both Scenarios, the producer borrows 100% of the establishment costs incurred in Year 1 and begins repayment in Year 2. The establishment costs in Year 1, along with their respective interest charges, are accumulated to the second year using an interest rate of 6.95% compounded annually. The total compounded amount represents the total cost of establishment that is to be repaid over a period of 25 years.

Table 9: Establishment Costs

Treatment of Establishment Costs	**Scenario 1**	**Scenario 2**
Year 1 Establishment Costs	**$49,000**	**$143,600**
Compounded Interest	$3,406	$9,980
Compounded Amount	**$52,406**	**$153,580**
Interest Rate	6.95%	6.95%
Term	25	25
Yearly Payment	**$4,477**	**$13,119**

To facilitate a straightforward approach to the economic analysis, it is necessary to assume constant costs and returns for each of the successive production years. It is for the same reason that the total compounded cost of establishment is amortized and the repayment of these costs is divided equally over the production years. By assuming that the establishment of the sheep farm increases the asset value of the land, the producer is able to depreciate the costs annually over a defined number of years of production.

Table 9 above shows the amortization of the total amount borrowed to cover the establishment costs in Year 1 over a 25 year period, at an interest rate of 6.95%.

Revenue

With the production of sheep, the revenue or return on the investment begins in Year 1; however, it will take several years before a producer should expect the flock to reach its maximum productivity and produce at a high lambing rate. On average, the ewe flock of a producer practicing best management practices in Nova Scotia should reach a lambing rate of approximately 160% to 190%, depending on the breed. (Producers using an accelerating lambing system should expect a lambing rate in excess of 200%.)

It is important that the producer understand the fundamental economics of supply and demand and how they drive prices. Current demand in Nova Scotia and Canada exceeds supply; therefore the market price is strong and has remained stable for the last few years and should continue to stay strong. Price fluctuations do occur as the result of seasonal supply, winter shortage of supply, and higher market demands during certain times of the year, such as Easter and Ramadan.

Contribution Margin

The contribution margin is the difference between the revenue generated and the expenses used to generate the revenue. The contribution margin must provide funds to cover the other expenses, such as the overhead, loan payments, and capital expenses.

The contribution margin for Scenario 1 is negative until Year 5. This is because the establishment costs are spread over the first five years of operation. After Year 7, the contribution margin remains steady at $16,074, increasing to $16,574 every fifth year when there is no guardian dog purchased. The contribution margin for Scenario 2 is only negative in Year 1 and will be constant at $16,074 in Year 7 and beyond. (See Appendix Chart 1 and 2 to see the break down of revenue and expenses used to calculate the contribution margin for each scenario.)

Breakeven Analysis

The breakeven period used in this report is defined as the number of years it takes to see a true return on the initial investment.

From Table 10 below, it can be easily seen that the requirement for financing the establishment of the sheep farm has a significant impact on the number of years it takes to breakeven. If the producer receives no financing for the establishment costs in Scenario 1 and Scenario 2, then the breakeven periods will be 15 years and 14 years, respectively.

If the producer does receive financing for the establishment costs in Scenario 1, the breakeven period is estimated to be 22 years. For Scenario 2, if the producer receives financing for the total cost of establishment, then the breakeven period is greater than 30 years. If a producer is interested in purchasing an operational 400 ewe flock, they should have significant financial resources because if they borrow the establishment costs in full, it is unlikely they will see a return on their investment in their lifetime.

In most cases, the producer will not have the cash flow to cover the establishment costs. The less the producer needs to borrow, the shorter the breakeven period. This means that the amount of financing required for the establishment of a sheep farm is positively related to the length of the breakeven period.

It should be noted that Table 10 represents estimates of breakeven years based on a stable price.

Table 10: Breakeven Analysis

Financing	Scenario	Breakeven Year
No	**Scenario 1**	15 years
	Scenario 2	14 years
Yes	**Scenario 1**	22 years
	Scenario 2	>30 Years

Conclusion

From the information presented in this report, it has been shown that there is a significant investment of money required for the establishment of a sheep farm in Nova Scotia. The successful raising of quality lamb requires the producer to pay close attention to both the management and financial details in order to ensure a return on the investment. If the establishment of the sheep farm does not require external financing, there is considerably less pressure on the finances, and the breakeven on the investment will occur much sooner, as seen in Table 10. Scenario 1 and Scenario 2 do not have a significant difference in their breakeven period if they do not require financing for their establishment costs. But, there is a significant difference if they do require financing for their establishment costs. Therefore, Scenario 1 may be the best option because it allows the producer to improve their management skills over the establishing years with less risk than if the producer purchased a full flock in Year 1, as in Scenario 2.

Business Planning Resources for Establishment of a Sheep Farm

There are a number of useful resources available to individuals wishing to establish a sheep farm in Nova Scotia, many of which are available by contacting one of the following:

Nova Scotia Department of Agriculture, Business Development and Economics
http://www.gov.ns.ca/agri/bde/

Nova Scotia Farm Loan Board
http://www.gov.ns.ca/agri/farmlb/

Canadian Sheep Federation
http://www.cansheep.ca/

AgraPoint
http://www.agrapoint.ca

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Appendix Chart 1: Scenario 1

Flock Inventory	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Number of Ewes	100	155	232	327	400	400	400	400	400	400
Number of Rams	2	3	5	8	8	8	8	8	8	8
Total Lambs	150	215	284	419	556	625	640	640	640	640
Ewe lamb replacement @ 20%	20	31	46	65	80	80	80	80	80	80
Ewe lambs retained for expansion	55	77	96	73						
Lambs to Market	75	108	142	281	476	545	560	560	560	560
Revenue										
Market Lambs @ $150/Lamb	$11,250	$16,125	$21,330	$42,129	$71,395	$81,694	$84,000	$84,000	$84,000	$84,000
Cull Ewes @ 15%	$750	$1,163	$1,736	$2,456	$3,003	$3,000	$3,000	$3,000	$3,000	$3,000
Cull Rams @ $70/Ram			$70	$140	$210	$210	$210	$210	$210	$210
Wool @ 5lbs/Sheep and $0.60/lb	$306	$474	$710	$1,006	$1,225	$1,224	$1,224	$1,224	$1,224	$1,224
Total Revenue	**$12,306**	**$17,762**	**$23,846**	**$45,731**	**$75,833**	**$86,128**	**$88,434**	**$88,434**	**$88,434**	**$88,434**
Establishment Costs										
Ewes @ $200/Ewe	$20,000									
Rams @ $500/Ram	$1,000	$500	$1,000	$1,500						
Guarding Dog(s) @ $500/Dog	$500	$500	$500	$500						
Fencing	$6,000	$3,700	$3,700	$3,700	$3,700					
Corral/Working Pens	$2,500	$1,000	$1,000							
Pasture Establishment/Improvement	$2,200	$2,200	$2,200	$2,200	$2,200					
Watering System	$1,500	$1,500	$1,500	$1,500						
Supplies & Equipment	$300									
Used Tractor with Loader	$15,000									
Variable Costs										
Forage	$4,320	$6,696	$10,001	$14,144	$17,297	$17,280	$17,280	$17,280	$17,280	$17,280
Grain - Ewes (and Rams)	$765	$1,185	$1,774	$2,516	$3,063	$3,060	$3,060	$3,060	$3,060	$3,060
Grain - Lambs	$2,250	$3,225	$4,266	$6,290	$8,341	$9,369	$9,600	$9,600	$9,600	$9,600
Salt & Minerals @ $2.50/Head	$630	$933	$1,302	$1,887	$2,411	$2,582	$2,620	$2,620	$2,620	$2,620
Pasture Maintenance	$1,240	$2,205	$3,445	$4,410	$5,650	$5,650	$5,650	$5,650	$5,650	$5,650
Vet Costs for Sheep	$708	$1,062	$1,515	$2,180	$2,746	$2,881	$2,912	$2,912	$2,912	$2,912
Shearing @ $3.50/Ewe	$357	$553	$828	$1,174	$1,429	$1,428	$1,428	$1,428	$1,428	$1,428
Replacement Ewe Lambs @ 20%	$3,000	$4,650	$6,945	$9,822	$12,012	$12,000	$12,000	$12,000	$12,000	$12,000
Replacement Rams @ 33%					$1,350	$1,350	$1,350	$1,350	$1,350	$1,350
Replacement Guardian Dog						$500	$500	$500	$500	
Guardian Dog(s) Operating Costs	$800	$1,600	$2,400	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200
Marketing & Hauling	$450	$645	$853	$1,685	$2,856	$3,268	$3,360	$3,360	$3,360	$3,360
Labour	$850	$1,318	$2,874	$4,924	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
Fuel & Utility	$1,100	$1,250	$1,500	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800
Equipment Repairs	$250	$313	$375	$500	$500	$500	$500	$500	$500	$500
Accounting Costs	$900	$900	$900	$900	$900	$900	$900	$900	$900	$900
Insurance Costs	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200
Establishment & Variable Costs Total	**$67,820**	**$37,135**	**$50,078**	**$66,031**	**$75,655**	**$71,968**	**$72,360**	**$72,360**	**$72,360**	**$71,860**
Contribution Margin	**-$55,514**	**-$19,373**	**-$26,232**	**-$20,301**	**$178**	**$14,160**	**$16,074**	**$16,074**	**$16,074**	**$16,574**
Fixed Costs										
Taxes	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Equipment Depreciation	$3,000	$2,400	$1,920	$1,536	$1,229	$983	$786	$629	$503	$403
Fixed Cost Total	**$4,000**	**$3,400**	**$2,920**	**$2,536**	**$2,229**	**$1,983**	**$1,786**	**$1,629**	**$1,503**	**$1,403**
Total Cost	**$71,820**	**$40,535**	**$52,998**	**$68,567**	**$77,884**	**$73,951**	**$74,146**	**$73,989**	**$73,863**	**$73,263**

Appendix Chart 2: Scenario 2

Flock Inventory	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Number of Ewes	400	400	400	400	400	400	400	400	400	400
Number of Rams	8	8	8	8	8	8	8	8	8	8
Total Lambs	600	560	576	592	608	624	640	640	640	640
Ewe lamb replacement @ 20%	80	80	80	80	80	80	80	80	80	80
Lambs to Market	520	480	496	512	528	544	560	560	560	560
Revenue										
Market Lambs @ $150/Lamb	$78,000	$72,000	$74,400	$76,800	$79,200	$81,600	$84,000	$84,000	$84,000	$84,000
Cull Ewes @ 15%	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000
Cull Rams @ $70/Ram		$70	$140	$210	$210	$210	$210	$210	$210	$210
Wool @ 5lbs/Sheep and $0.60/lb	$1,224	$1,224	$1,224	$1,224	$1,224	$1,224	$1,224	$1,224	$1,224	$1,224
Total Revenue	**$82,224**	**$76,294**	**$78,764**	**$81,234**	**$83,634**	**$86,034**	**$88,434**	**$88,434**	**$88,434**	**$88,434**
Establishment Costs										
Ewes @ $200/Ewe	$80,000									
Rams @ $500/Ram	$4,000									
Guarding Dogs @ $500/Dog	$2,000									
Fencing	$20,800									
Corral/Working Pens	$4,500									
Pasture Establishment/Improvement	$11,000									
Watering System	$6,000									
Supplies & Equipment	$300									
Used Tractor with Loader	$15,000									
Variable Costs										
Forage	$17,280	$17,280	$17,280	$17,280	$17,280	$17,280	$17,280	$17,280	$17,280	$17,280
Grain - Ewes (and Rams)	$3,060	$3,060	$3,060	$3,060	$3,060	$3,060	$3,060	$3,060	$3,060	$3,060
Grain - Lambs	$9,000	$8,400	$8,640	$8,880	$9,120	$9,360	$9,600	$9,600	$9,600	$9,600
Salt & Minerals @ $2.50/Head	$2,520	$2,420	$2,460	$2,500	$2,540	$2,580	$2,620	$2,620	$2,620	$2,620
Pasture Maintenance	$5,650	$5,650	$5,650	$5,650	$5,650	$5,650	$5,650	$5,650	$5,650	$5,650
Vet Costs for Sheep	$2,832	$2,752	$2,784	$2,816	$2,848	$2,880	$2,912	$2,912	$2,912	$2,912
Shearing @ $3.50/Ewe	$1,428	$1,428	$1,428	$1,428	$1,428	$1,428	$1,428	$1,428	$1,428	$1,428
Replacement Ewe Lambs @ 20%	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000
Replacement Rams @ 33%		$500	$1,000	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350	$1,350
Replacement Guardian Dog		$500	$500	$500	$500	$500	$500	$500	$500	$500
Guardian Dog(s) Operating Costs	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200
Marketing & Hauling	$3,120	$2,880	$2,976	$3,072	$3,168	$3,264	$3,360	$3,360	$3,360	$3,360
Labour	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
Fuel & Utility	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800
Equipment Repairs	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500
Accounting Costs	$900	$900	$900	$900	$900	$900	$900	$900	$900	$900
Insurance Costs	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200
Establishment & Variable Costs Total	**$213,090**	**$69,470**	**$70,378**	**$71,136**	**$71,544**	**$71,952**	**$72,360**	**$72,360**	**$72,360**	**$72,360**
Contribution Margin	**-$130,866**	**$6,824**	**$8,386**	**$10,098**	**$12,090**	**$14,082**	**$16,074**	**$16,074**	**$16,074**	**$16,074**
Fixed Costs										
Taxes	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Equipment Depreciation	$3,000	$2,400	$1,920	$1,536	$1,229	$983	$786	$629	$503	$403
Fixed Cost Total	**$4,000**	**$3,400**	**$2,920**	**$2,536**	**$2,229**	**$1,983**	**$1,786**	**$1,629**	**$1,503**	**$1,403**
Total Cost	**$217,090**	**$72,870**	**$73,298**	**$73,672**	**$73,773**	**$73,935**	**$74,146**	**$73,989**	**$73,863**	**$73,763**

Appendix Chart 3: Budget Explanation and Assumptions

Flock Inventory	
Number of Ewes	Number of ewes in breeding herd. Raise own replacements.
Number of Rams	Number of rams for breeding. One mature ram per 50 ewes.
Total Lambs	Total lambs born per year. 150% of number of ewes in year 1. Increase by 5% each year until percentage reaches 180%.
Ewe lamb replacement	20 percent of flock replaced each year. 15% accounts for cull ewes and 5% for death loss.
Ewe lambs retained for expansion	(Total lambs x 0.50) - (Number of ewe lamb replacements) 0.50 assumes that half the total lambs are ewe lambs.
Lambs to Market	Total number of lambs less the lamb replacement and lamb expansion.
Revenue	
Market Lambs	Number of lambs to market x Market price. Assumed to be an average of $150 per lamb for the life of the operation.
Cull Ewes	Number of ewes sold to market at an average price of $50 per ewe. Cull rate is 15% of total number of ewes.
Cull Rams	Number of rams sold to market at an average price of $70 per ram. Cull rate is 33% of total number of rams.
Wool	Average fleece weight is 5lb/ewe (or ram) and sold for $0.60/lb. (Number of rams + number of ewes) x 5 x $0.60
Total Revenue	
Establishment Costs	
Ewes	Cost to purchase ewes. Assume $200/ewe.
Rams	Cost to purchase rams. Assume $500/ram.
Guarding Dog(s)	Cost to purchase guardian dogs. Assume $500/dog.
Fencing	$3700 to build 5 strand electric fence per 20 acres. $1000 for internal fencing. $1300 for electric fence energizer.
Corral/Working Pens	$2500 to purchase handling system. $2000 to build working pens (spread over 2 years in scenario 1).
Pasture Establishment/Improvement	Assume $2200 per 20 acres.
Watering System	Assume $6000 in total (spread over 4 years in scenario 1).
Supplies & Equipment	$300 in total. This includes miscellaneous equipment such as: syringes, hoof trimming shears, and deworming gun, etc
Used Tractor with Loader	$15,000 to purchase used tractor. Tractor is assumed to have a life span of ten years.
Variable Costs	
Forage	Forage fed in the winter for 180 days, approx. 4.5 lb/ewe per day. Value is $43.20/ewe per year.
Grain - Ewes (and Rams)	Flushing 30 days at 0.5 lb/day and lactating 30 days at 2 lb/day. Current grain price $220/tonne. Value is $7.50/ewe/year.
Grain - Lambs	Finishing lambs for 60 days at 2.5 lb/day. Current grain price $220/tonne. Value is $15/lamb per year.
Salt & Minerals	Assume $2.50/head.
Pasture Maintenance	Includes fertilizer and lime. Scenario 1 cost increases as pasture increases until 100 acres is reached in year 5.
Vet Costs for Sheep	Assume $4/ewe (and ram) and $2/lamb. Includes cost of deworming, vaccinations, and incidental veterinary services.
Shearing	Assume $3.50/head.
Replacement Ewe Lambs	Assume market value of $150/lamb. 20% accounts for 15% culling rate and 5% death loss.
Replacement Rams	Assume replacement cost $500/lamb and replacement rate of 33%. Life expectancy of ram is assumed to be three years.
Replacement Guardian Dog	Replace dogs at $500/dog. Working life span of a dog is assumed to be 5 years.
Guardian Dog(s) Operating Costs	Assume $800/dog per year. Includes food, deworming, vaccinations and spaying/neutering.
Marketing & Hauling	Assume $6/lamb. Includes check-off and trucking.
Labour	Includes help with lambing (20 days @ $10/hr), wool packing ($0.50/ewe) and manure spreading ($8.00/ewe).
Fuel & Utility	Fuel is tractor diesel for chores. Utility is hydro cost of barn.
Equipment Repairs	Based on hours used, which is directly related to the number of ewes.
Accounting Costs	Assume $900/year based on costs of a farm of similar size and structure.
Insurance Costs	Assume $1200/year. Includes fire, farm liability, barn contents, livestock insurance, etc.,
Establishment & Variable Costs Total	
Contribution Margin	
Fixed Costs	
Taxes	Property taxes on a 100 acre farm. Assume $1000/year.
Equipment Depreciation	Assume used tractor has a life span of ten years. Tractor depreciates in value at 20% per year.
Fixed Cost Total	
Total Cost	