

Technical Note

Enterprise Budgeting for Ewe Flock Operations

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Enterprise budgeting is a tool producers can use to evaluate current and alternative enterprises for profitability. Enterprise budgets are typically completed for operations that are not undergoing significant change. This ignores any transition or implementation phase necessary to make changes or start an entirely new enterprise. While some changes may take several years to implement, others can be accomplished in one production period. EweCost is a tool that assists sheep producers in analyzing current and potential future alternative operating procedures for an ewe flock. The end point in this enterprise is feeder lambs and wool.

The EweCost program is divided into four sections; 1) revenue calculation and inventory check, 2) enterprise operating costs, 3) enterprise ownership costs, and 4) results. To save space, only a portion of the results and input are presented here. Not shown are inputs required for the leasing analysis, sensitivity tables that vary prices, weights and weaning percentage from the results section, graphs showing breakdowns of income and expense and the results of the share and cash lease analysis. While there is extensive use of color in the software, some information that color is designed to enhance is lost when printed in black and white. Information the user is either allowed or required to enter is displayed in blue text and outlined in double lined

boxes. Numbers or labels outside of a double lined box are calculated or fixed and cannot be changed.

The sample printout indicates "Help" and other explanatory information is available in the left margin. Help messages are built into this program in several locations, some of which do not show when printed. The help messages are included to help clarify input required by the user and how to interpret results generated by the program. The user can access these help messages by pointing to cells that have a Help, or similar label, and to cells that have a red triangle in the upper right corner. The red triangles do not show on a printout.

The EweCost program is provided as an Excel spreadsheet, in Excel 97 format. This program can be obtained from the authors or can be downloaded from the web site: <http://www.montana.edu/extensionecon>.

The first section requires the user to enter basic production parameters about number of ewes, weaning percentages, weaning weights, prices, etc. The program uses this information to estimate revenue generated from the enterprise. Revenue is calculated for each animal group and also per head using the parameters specified by the user. Both a cash and non-cash component is included in the revenue section. In most ewe

flocks, lambs are held as replacements to maintain the quality of the ewe flock. Lambs kept for this purpose generate costs but no revenue. This software gives the enterprise credit for producing the value associated with replacements lambs but clearly separates this non-cash revenue from the cash sources. This provides a more comprehensive picture of the resource base (ewe flock) being analyzed. Purchased replacements can be analyzed as an alternative means of operation.

In addition, the first section of the program also conducts a check to assure that the enterprise budget being prepared is for a stable operation, i.e. the beginning and ending inventory of breeding ewes on hand are, or very close to identical. If the beginning and ending inventory of ewes is not similar, then the budget is for an ewe flock that is either constantly in-

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creasing or decreasing over time. This program can be used to analyze this type of expansion or contraction but the budget prepared is only valid for one production period.

The second section of the program allows users to enter operating costs for the enterprise. Operating costs are also called variable costs. These are costs that vary with the level of production. While operating costs can be collected in many different formats, they are generally considered per unit costs. For each additional unit of production the same cost is incurred, i.e. each additional sheep must be fed, vaccinated, etc. and each of these activities cost the same amount per head. The user must take care that changes made in one section of the program, i.e. number of ewes in the enterprise (revenue section) are accompanied by changes in appropriate operating costs. This program collects these costs for the total enterprise and then calculates the per head costs. Brief summaries of total operating costs for the enterprise and per head are given at the end of the operating cost input section.

The third section of the program allows the user to enter ownership costs for the enterprise. Ownership costs are also referred to as fixed costs. While operating costs vary with the level of production (linear in most economic budgeting techniques) fixed costs do not vary with the level of production and per unit values vary inversely with the level of production. An example would be the costs to own a tractor. If you add an additional 50 head of ewes to the breeding flock, the taxes or insurance on the tractor will not change. Enterprise operating costs would change (fuel, repairs, feed, vet & medicine, etc.) but the same tax and insurance cost would be charged against the ewe flock. The tax and insurance cost per ewe would decline.

Ownership costs are typically divided into four categories. These are depreciation, interest (or opportunity costs), taxes, and insurance. Each of these four categories is listed for the basic set of re-

sources used for an ewe flock operation. The basic set of resources includes machinery and equipment, buildings and improvements, land, and the ewe flock. The user must enter information for resources used for the ewe enterprise on their operation.

The treatment of depreciation for the ewe flock, or any raised livestock enterprise, is a special case. Since this program is designed to handle estimating cost of production and calculating equitable share and cash lease arrangements, additional consideration must be given to how depreciation is charged to the ewe flock enterprise. If the program is used to estimate the cost of your own ewe flock operation and replacements are held from annual production, no depreciation should be included. The cost of replacement ewe development is already included in the budgeted expenses and the ewe flock is maintaining its value. While individual animals may be "wearing out" similar to a tractor, the ewe flock is not. Including both depreciation and replacement ewe development expenses would double count some expenses for the ewe flock. If replacements are purchased, then depreciation is used as a proxy for the annual cost associated with maintaining the ewe flock at its average value. The program includes significant help messages to guide the user as to when and how to enter depreciation expense. The same procedure for depreciation is used in both leasing analysis and estimating cost of production. The example printout is for an owned ewe flock and does not include a depreciation charge for the ewe flock but does for the purchased rams. Total ownership costs are summarized at the end of this section of the program.

Only a partial listing of the results, the fourth section, is included in this article. Shown is a summary of the incomes and expenses presented in both a profit and loss and cash flow format. Profitability includes all income and expenses incurred during the enterprise production process. These incomes and expenses include both cash and non-cash items.

Depreciation is a common and well-understood non-cash expense. Depreciation is claimed as an expense for the operation but cash is not required to cover this expense. A detailed cash flow analysis looks at cash income and expenses as well as other cash inflows and outflows that are paid or received in cash. The most common example of a cash outflow that is not an expense is principal payments. While the Cash Flow format is presented here, caution must be used in its interpretation. This spreadsheet does not collect enough information to analyze an individual's actual debt situation. That would require information for each individual loan, which has some relevance for this enterprise, and prorating the loan information (principal and interest) to this enterprise. That level of detail is beyond this spreadsheet. User can visit the web site listed above for other software that will allow through cash flow analysis. The interpretation of the Cash Flow results presented in this template is then, a best-case scenario, i.e. a debt free enterprise. The Cash Flow results are useful for risk assessment for the enterprise and providing a number that can be used to calculate debt servicing ability for the enterprise. The example printout indicates how Profitability and Cash Flow analysis can provide a very different picture of the enterprise. Profitability analysis indicates the enterprise is losing approximately \$87.17 per head. The Cash Flow analysis indicates the enterprise is making \$5.62 per head, again a best-case scenario. What is the difference? Note that the cash flow analysis excludes the "Interest (Opportunity Cost)" charge used in the profitability analysis. The opportunity cost is a charge made to show the cost of using resources in sheep production rather than their next best alternative. In this program interest (opportunity cost) is calculated using the interest rate entered by the user in the Operating Cost section for interest on operating costs and the real rate of interest, calculated from user input on average investment entered in the ownership cost section of the program. The opportunity cost calculated for this example is \$3.40 per head for operating and \$95.13

per head for ownership costs. The print-out indicates these are included in the Profitability analysis and excluded from the Cash Flow analysis.

Note: Be careful when budgeting that you do not assign a degree of accuracy to results that may not exist. The results are only as good as the data used to calculate the results. While a computer program will calculate numbers down to several decimal places, users should always

be wary of how to interpret these calculations. An example is the treatment of interest (opportunity cost) discussed above. Eliminating all interest (opportunity costs) from the cash flow analysis may make the cash flow position look better than it actually is for an individual producer. It would be difficult to collect enough information from an individual to determine actual financing arrangements on all assets so that the true cash flows for actual principal and interest

payments is include in the Cash Flow analysis. This spreadsheet is a budgeting tool and provides producers an opportunity to estimate profitability, cash flow and evaluate the impact of management changes in the enterprise.

Section 1: Revenues and Cow Numbers Check—Cost of Production Estimates for Commercial Ewe Flock Enterprise

Double lined boxes and blue text indicate numbers that are required/allowed for data entry.

Number of ewes	1950	Weaning Percentage	120%
Cull Rate	20%	Rep. Lambs Needed	390
Value of Avg Ewe in Breeding Flock	\$60	Rep. Lambs Kept	600

Value of Production

Value of Production for Actual Cash Sales

	Quantity	Net Market Weight	Price Per Pound	Pounds Produced	Value Per Head	Total Value
Wether	1170	94	\$0.82	109,980	\$77	\$90,184
Ewe Lambs	570	88	\$0.82	50,160	\$72	\$41,131
Cull Ewe Sales	350	150	\$0.25	52,500	\$38	\$13,125
Cull Replacement Ewe Lamb Sales	200	120	\$0.50	24,000	\$60	\$12,000
Other Income (Wool and	1	17550	\$1.00		\$9	\$17,550
Cull Ram Sales	4	200	\$0.25	800	\$50	\$200
Totals	2295			237,440		\$174,190
				Total Pounds Produced From Wethers and Ewe Lambs	160,140	\$131,314.80

Replacement Ewe Lambs

	Quantity	Weight	Price Per Pound	Pounds Produced	Base Value Per Ewe	Total Value
Purchased Replacement Ewes/Lambs	0	0	\$0.00		\$0	\$0.00
Non-Cash Adjustments to the "Cash" Value of Production						
Raised Replacements						
Transferred of Raised Ewe Lambs To Breeding	390	85	\$0.54	33,150	\$46	\$17,901.00
Death Loss of Replacement Ewe Lambs	10	115	\$0.54	1,150	\$62	(\$621)
Total Revenue (Lamb & Non-Lamb, Cash and Non-Cash)						\$191,470

Since this is a "budget" for a typical years operation, ewe flock size should not vary significantly from the beginning to the end of the year. If the numbers entered show significant variation from the beginning to the end of the year in the numbers check below, adjust the cull ewe numbers, death loss, or replacement ewe lamb numbers until that variation is eliminated.

Check on Breeding Ewe Numbers (Beginning to End)	Number	Dollar Value
Beginning Inventory of Ewes	1950	\$117,000
+ Raised Replacement Lambs Kept	600	\$27,540
- Excess Raised Rep. Ewe Lambs Sold	200	(\$12,000)
+ Purchased Replacement Lambs	0	\$0
- Cull Ewe Sales	350	(\$13,125)
- Death Loss Breeding Ewes	40	(\$1,500)
- Death Loss Replacement Ewes Lambs	10	(\$621)
= Ending Inventory	1950	\$117,294

Template Options and Explanations:

This template can be used to estimate the costs of production and break-even prices for 1) Commercial Ewe Flock operations (owned or leased), 2) a feeders/backgrounding enterprise, or 3) a yearling enterprise. Each of these enterprises can be evaluated independent of the others, or you can start with the ewe flock enterprise and follow through each phase or production cycle to get to the desired end point. The "Feeders" page tab allows for both short and long term backgrounding and analysis of finished slaughter lambs, however not all at the same time. You may have to run the Feeders page info for each scenario desired if going to a finished slaughter weight through retained ownership.

This template can be used for analysis of cost share or cash leasing but if that is not your objective, simply ignore the columns and other information related to leases.

Please read the notes and helps included throughout this template to make sure you understand what number is to be entered or how to interpret a result. These notes and helps are indicated by a small red triangle in the upper right corner of a cell. Simple place your cursor on top of the cell to view the help message or note attached to that cell.

Section 2:

Operating Costs for a Ewe Flock Enterprise

Feed Costs (Raised and Purchased)				Value	Value	
	Units	Quantity	Price		Per Head	
Help	hay	ton	900.00	\$80.00	\$72,000	\$36.92
	State lease	AUM	900.00	\$3.50	\$3,150	\$1.62
	Forest service	AUM	600	\$1.35	\$810	\$0.42
	Pasture Lease #2	AUM	0	\$0.00	\$0	\$0.00
	Pasture Lease #3	AUM	0	\$0.00	\$0	\$0.00
	Salt & Mineral	Ton	15.00	\$500.00	\$7,500	\$3.85
	Barley	Ton	20.00	\$70.00	\$1,400	\$0.72
	Crop Residue	AUM	1000.00	\$0.00	\$0	\$0.00
	Straw	Ton	0.00	\$0.00	\$0	\$0.00
	alfalfa pellets (processing)	ton	40.00	\$45.00	\$1,800	\$0.92
	Other	Ton	0.00	\$0.00	\$0	\$0.00
	Other	Ton	0.00	\$0.00	\$0	\$0.00

Subtotal of Feed Costs \$86,660 \$44.44

Operating Costs Directly Associated With Livestock Care and Handling

Help	Vet and Medicine			\$2,400	\$1.23
	Livestock Hauling (Not Related to Marketing)			\$0	\$0.00
	Professional Fees (Dues, Subscriptions, Legal, etc.)			\$1,000	\$0.51
	Hired Labor			\$40,000	\$20.51
	Marketing Costs	Price/Unit	No. of Units		
	Sales Commission	\$0.00	0.00	\$0.00	\$0.00
	Hauling to Market	\$0.00	0.00	\$0.00	\$0.00
	Yardage	\$0.00	0.00	\$0.00	\$0.00
	Custom Hire			\$0	\$0.00
	Rent or Lease (Vehicle, Machinery, Equipment)			\$0	\$0.00
	Utilities			\$600	\$0.31
	Supplies			\$1,700	\$0.87
	All Shearing Costs			\$4,800	\$2.46
	Other Operating Costs- tagging			\$1,600	\$0.82

Operating Costs of Facilities and Equip. Used in Lvstck Production.

Help	Operating Costs of Equipment (Fuel, Oil, Repairs)			\$1,000	\$0.51
	Operating Costs on Machinery (Fuel, Oil, Repairs)			\$1,000	\$0.51
	Operating Costs of Vehicles (Fuel, Oil, Repairs)			\$3,000	\$1.54
	Facility Repairs and Maintenance				\$0.00
	Fences			\$30.00	\$0.02
	Corrals			\$0.00	\$0.00
	Buildings			\$550.00	\$0.33
	Water Facilities			\$900.00	\$0.41
	Hired Labor			\$0.00	\$0.00
	Rent or Lease			\$0.00	\$0.00
	Supplies			\$300.00	\$0.15
	Utilities			\$2,000.00	\$1.03
	Other			\$0.00	\$0.00
	Other			\$0.00	\$0.00
	Other			\$0.00	\$0.00

SUBTOTAL OTHER VARIABLE COSTS \$60,880 \$31.22

Interest on Operating Costs

Sum of Operating Costs x Months Borrowed
x Interest Rate Per Month
Annual Interest Rate (11% = .11)
Avg. Number of Months Money Borrowed
Annual Inflation Rate (9% = .09)

9.00%
6
3.00%

Int. Formula Total Interest Cost (Real Rate of Interest) \$6,639 \$3.40

Total Operating Costs

\$154,179 \$79.07

Returns Above Total Operating Costs

\$19,390 \$9.94

(Excluding Replacement Ewe Lambs Non-Cash Revenue; Includes Death Loss)

Section 4: Results-- Cost of Production and Leasing, if Leasing Analysis Utilized

Lease share percentages based on how costs are shared	Lease Percent based on cost share	Weighted	Weighted
		Average Sale Price	Average Sales Weight
EweOwner share of Total Cost of Production	0.00%		
Tenant's Share of Total Cost of Production	100.00%		
check sum	100.00%	\$82.00	92.03

Interpretation of percentage split calculation

Profitability and Cash Flow Summary for the Ewe Flock Enterprise

For accurate presentation of the Profitability and Cash Flow tables below for the Ewe Owner and Tenant, sharing of cull ewe and cull ram revenue must be determined. Economic theory suggests that if the ewe owner is providing the replacement ewes and rams, he/she is entitled to all cull revenue. If however, replacements are kept from the lamb crop, and development costs are shared by the ewe owner and tenant, the cull revenue should also be shared.

	Y or N		Tenant-Owner
Is cull ewe revenue shared?	<input type="checkbox"/> Y	If No, who receives revenue? (O or T)	<input type="checkbox"/> O
Is cull ram revenue shared?	<input type="checkbox"/> Y	If No, who receives revenue? (O or T)	<input type="checkbox"/> T
Do not enter Yes or No, only Y or N, your input is not case sensitive.		Enter only an O or T	

Graphics of Income and Expenses to right of this table. (Column R)

Interpretation of Profitability and Cash Flow--Caution

Sources of Revenue	For Entire Ewe Flock Enterprise			
	Profitability		Cash Flow	
	Total	Per Head	Total	Per Head
Wether	\$90,184	\$46.25	\$90,184	\$46.25
Ewe Lambs	\$41,131	\$21.09	\$41,131	\$21.09
Cull Ewes	\$13,125	\$6.73	\$13,125	\$6.73
Excess Rep Ewe Lambs	\$12,000	\$6.15	\$12,000	\$6.15
Cull Rams	\$200	\$0.10	\$200	\$0.10
Other Income (Wool, and)	\$17,550	\$9.00	\$17,550	\$9.00
Cash Revenue from Ewe Flock Enterprise - Subtotal	\$174,190	\$89.33	\$174,190	\$89.33
Non-Cash Revenue Adjustment - Rep Ewe Lambs	\$17,901	\$9.18		
Non-Cash Revenue Adjustment for Death Loss	(\$621)	(\$0.32)		
Total Revenue	\$191,470	\$98.19	\$174,190	\$89.33
Percent total Revenue (Cash and Non-Cash) >>				
Operating Costs (Variable Costs)	Profitability		Cash Flow	
	Total	Per Head	Total	Per Head
Feed Costs	\$86,660	\$44.44	\$86,660	\$44.44
Operating Costs Associated with Lvstk Care	\$52,100	\$26.72	\$52,100	\$26.72
Facilities and Equipment Operating Costs	\$8,780	\$4.50	\$8,780	\$4.50
Interest on Operating Costs	\$6,639	\$3.40		
Total Operating Costs of Production	\$154,179	\$79.07	\$147,540	\$75.66
Returns Above Operating Costs (Excluding Rep. Lamb N.C. Rev.)	\$19,390	\$9.94	\$26,650	\$13.67
Ownership Costs (Fixed Costs)				
Depreciation	\$6,082	\$3.12		
Insurance	\$1,300	\$0.67	\$1,300	\$0.67
Taxes	\$14,400	\$7.38	\$14,400	\$7.38
Interest (Opportunity Cost)	\$185,496	\$95.13		
Total Ownership Costs	\$207,278	\$106.30	\$15,700	\$8.05
Total Costs (Operating and Ownership)	\$361,457	\$185.36	\$163,240	\$83.71
Net Returns Above Operating Plus Ownership Costs	(\$169,988)	(\$87.17)	\$10,950	\$5.62
Enter the total value of unpaid family labor and management	\$30,000			
Percent of unpaid labor and management for this enterprise	40%			
Return on Investment/Assets (ROI=ROA)	0.32%			

The breakeven calculations presented at right are based on the pounds of lamb actually sold. Emphasis are on costs and the breakeven is the amount lambs must sell for, to cover operating and total costs. The breakevens are calculated with and without consideration of non-lamb revenue (cull ewes, wool, etc.). Costs are adjusted for shearing.

Breakeven Calculations Excluding Non Lamb Revenue

Operating Costs	Operating + Ownership Costs
101.51%	242.36%
104.70	249.97
\$93.28	\$222.72

Required Lambing Percentage (Using Weighted Averages) to Cover
 Required Avg. Lamb Weaning Weights (Using Weighted Avg Prices)
 Required Avg. Lamb Prices (\$/Cwt) (Using Weighted Avg Weight)