Enterprise Accounting

by

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October 15, 1997

Introduction

Enterprise budgets record the income or revenue, expense, and returns for a single crop or livestock production process. An enterprise is any coherent portion of the general structure of the farm business that can be separated out and analyzed as a distinct entity. For example, there is not a meaningful way to separate the oats enterprise into oats grain and oats straw enterprises, but the oats enterprise is separable from the corn or dairy enterprises.

Enterprise budgets can be created for different levels of production or technology so there can be more than one budget for a given enterprise. (An enterprise budget results from looking at a point on a production function.) The base unit for enterprise budgets is typically one acre for crops and one head for livestock. Using these common units permits an easy and fair comparison across different enterprises. Enterprise budgets are generally for one year, however other time periods are permitted.

Enterprise budgets can be used for both planning and financial analysis. The primary purpose of a **planning enterprise budget** is to estimate costs and returns per acre or per head. The primary purpose of a **financial analysis enterprise budget** is to determine actual costs and returns per acre or per head. Once this task is completed, enterprise budgets have other uses. They can be used to identify the most profitable enterprises to include in a whole farm budget and provide the basis for partial budgeting. Also, they will contain the data needed to compute the cost of production, the break-even price and/or production, and the sensitivity analysis on certain (fluctuating) prices or production factors.

Enterprise accounting extremely useful but is more complex than total farm accounting for four reasons:

1) Incomes or revenues must be kept separately.
2) Expenses must be kept separately.
3) Transfers from one enterprise to another within the total farm must be recorded.
4) Certain resources are used by more than one enterprise. This means a decision must be made regarding the allocation (by enterprise) of the costs associated with those resources.

Format of an Enterprise Budget

The top of the enterprise budget should contain the name of the enterprise being budgeted, the State or region of the budget, and the year from which prices were selected. If the time length represented by this budget is different than one year, that time period should be stated here. Typically the incomes or revenues from the enterprise are shown next. The name of the revenue source, the quantity, the unit, and price per unit should be included to provide the user with the budget's background.

Example:

Wisconsin **Bison** Budget 1997
Sold as a "weaned calf"
(per year per cow in a 50 cow herd)

Gross Returns	NO.	WEIGHT	UNIT	$/UNIT	**TOTAL**

Males Sold	0.45	450	lbs	$2.67	$540.00
Females Sold	0.45	350	lbs	$2.86	$450.00
			Total Gross Returns		$990.00

Income from cull breeding stock can be included as revenue or as a credit against the cost of buying replacement-breeding stock. The choice is personal preference. This example includes it as a credit against replacement breeding stock because the cost of buying replacements is offset by the sale of cull animals.

The cost section follows and is generally divided into two or three parts. Those parts are called by a number of different names: Operating and Capital; Variable and Fixed; or Direct and Indirect, but they all are basically the same. When budgeting alternative enterprises, the cost section usually has less variability and uncertainty than the income section.

If costs are divided into three parts, the third part is labor. Labor is under the operating costs in the two part system. Labor is sometimes treated separately because an author wishes to convey to the reader the importance of this cost and/or to show a return to labor and management in addition to a return over operating costs. This is especially true if all the labor required for the enterprise budget is the owner's or the owner's family because a "family draw" is required regardless of the enterprise's income.

Example:

Operating Costs	QUANTITY	UNIT	$/UNIT	**TOTAL**
Pasture	3	tons	$20.00	$60.00
Hay	3.5	tons	$60.00	$210.00
Corn Silage	0.00	tons	$25.00	$0.00
Misc. Forages	0.00	tons	$0.00	$0.00
Corn	0.00	bu	$2.25	$0.00
Protein (NPN)	0.00	lbs	$0.04	$0.00
Salt and Mineral	70.00	lbs	$0.15	$10.50
Breeding Fees	0.00	service	$25.00	$0.00
Veterinary & Medicine	1.00	cow	$30.00	$30.00
Marketing & Trucking	0.90	calf	$25.00	$22.50
Fuel & Utilities	1.00	cow	$10.00	$10.00
Bedding & Supplies	1.00	cow	$10.00	$10.00
Interest on Operating Costs*	$176.50		10.00%	$17.65
* On 1/2 of above costs	**Total Operating Costs**			$370.65

	QUANTITY	UNIT	$/HOUR	**TOTAL**
Labor Costs	8.00	hrs	10.00	$80.00

Capital Costs	QUANTITY	UNIT	VALUE	**TOTAL**
Equipment	$270.00	per cow	15%	$40.50
Buildings	$0.00	per cow	10%	$0.00
Breeding Stock-Interest Only	$2,550.00	per cow	10%	$255.00
Purchase Replacement Cow	0.07	head	$2,250	$157.50
Less: Sale of Cull Cow	0.05	head	$1,648	($82.38)

Net Bull Replacement Costs	2.5 head	$1,003	$50.14
	Net Capital Costs		$420.76

In the cost section, it is advisable to enter “obvious” cost items with a zero value if indeed the cost is zero. This tells the reader that the budget’s author was aware of the possibility of that cost and has assigned it a zero value in this budget. This is the case on the “Buildings” item in this Capital Costs section and also with several items in the Operating Costs section.

The “Interest on Operating Costs” item is normally calculated assuming the operating costs occur throughout the year and that the average operating costs incurred are 1/2 of the total operating costs. The capital costs of breeding livestock are treated somewhat different than the capital costs of other items. Breeding livestock capital costs are the interest on the breeding livestock’s’ value plus the net cost of maintaining the value of the herd.

The third section of an enterprise budget is the Cost and Returns summary section. This section usually contains “Returns Over Operating Costs”, sometimes called “Gross Margin”, the residual claimant “Return to Labor and Management”, and the “Profit (or loss) on the Enterprise.” This section can have one or more columns, depending on the information the author wishes to convey.

Note: A residual claimant is a resource(s) that claims all the remaining income, above some allocation of costs to other resources, as its return.

Example:

Costs and Returns

	PER CALF	PER COW	HERD
Gross Returns	$1,100.00	$990.00	$49,500
- Operating Costs	$411.83	$370.65	$18,533
= Return Over Operating Costs	$688.17	$619.35	$30,968
- Net Capital Costs	$467.51	$420.76	$21,038
= Return to Labor and Management	$220.66	$198.59	$9,930
- Labor Costs	$88.89	$80.00	$4,000
- Management Opportunity Cost at* 7.00%	$77.00	$69.30	$3,465
= Profit (Loss) on Enterprise	$54.77	$49.29	$2,465

* Normally calculated as a percent of gross income.

The fourth section of an enterprise budget is a listing of the critical values used in constructing the budget and maybe some break-even or sensitivity analysis of certain (fluctuating) production factors and/or prices. Generally the budget is one page and the back of the page contains the critical factors and other information.

Example: back page

PRODUCTION FACTORS

Calves per Cow	0.9 Net After Death Loss		
Percent Cow Death Loss	2%		
Cow Culling Rate	5%	Meat Price $/lbs	$3.00
Bull Replacement Rate	50%	Dressing Percent	52.00%
Yearling Death Rate	1%		

Weaned Calf's Value (sold as breeding stock)	Female	Male
	$1,000	$1,200

CAPITAL INVESTMENT

		NUMBER OF HEAD	VALUE PER HD	TOTAL VALUE	CULL VALUE PER HD
BREEDING HERD:					
	Cows	50	$2,250	$112,500	$1,648
	Bulls	5	$3,000	$15,000	$1,997

EQUIPMENT:	VALUE-calf	VALUE-yearling	VALUE-total
Handling and Processing	$7,000	$0	$7,000
Fencing	$5,000	$5,000	$10,000
Feeding	$1,500	$0	$1,500

BUILDINGS:	VALUE-calf	VALUE-yearling	VALUE-total
Winter Housing	$0	$0	$0

CAPITAL RECOVERY CHARGE (CRC):

	percent
Equipment	15%
Buildings	10%

Example: Sensitivity analysis table

This table show the “Returns to Labor and Management” per cow as the number of calves per cow and the purchase price of a cow changes. The value obtained in the included enterprise budget ($199) is usually highlighted or offset is some manner. The number of tables included varies.

Cow Price	Calves per Cow 0.80	0.85	**0.90**	0.95
$1,750	$176	$230	$284	$337
$2,250	$91	$145	$199	$252
$2,750	$6	$60	$114	$167
$3,250	($79)	($25)	$29	$82

Definitions

Revenues or Incomes are the results of the production process. They are usually quite straightforward; however, some revenues are shared, hidden, or used by other enterprises. Examples:

- Cash payments for production sold (crops, livestock, or livestock production)
- Government program payments
- Cash insurance payment for damages

Non-cash revenues for feed fed to other internal livestock enterprises
Non-cash revenues for livestock transferred to other internal livestock enterprises
Non-cash revenues for residue
A legume crop's nitrogen credit
Livestock wastes (manure, etc.)

Operating (Variable) Costs are costs (expenses) that vary when the enterprise is increased or decreased in intensity. Examples:

Seed
Fertilizer & Lime
    Livestock waste used as fertilizer
Chemicals
Crop Insurance
Custom Work
Feed
Fuel & lubrication (Including Irrigation Energy)
Repairs
Hired Labor and Fringe Benefits
Rent
Misc. Cash Fees & Supplies (Soil testing, etc.)
Interest (On above costs from time of use until payment for output)

Capital (Fixed) Costs are costs that do <u>not</u> vary when an enterprise is increased or decreased in intensity. Example: obsolescence is a fixed cost, because equipment will become obsolete even if it is not used. Other examples:

Building (CRC*)
Cropping Equipment (CRC*)
Irrigation Equipment (CRC*)
Liability, Fire, and Casualty Insurance
Property Taxes
Livestock (Opportunity Interest Cost plus replacement costs - cull income)
Land (Opportunity Interest Cost)
Repairs, such as roofs -- that do not vary with use
Unpaid labor & management (operator's salary)

* See Appendix A

Allocating Costs Across Multiple Enterprises

Building, machinery, and equipment:

These resources are often used by more than one enterprise. The allocation of costs is based on intent. If the item was purchased for major use by more than one enterprise, costs for that item should be allocated according to percentage use. Example: planter for snapbeans and corn.

If the item was purchased for major use by one enterprise and is used part time by another, only the operating costs for the time used should be charged to the

secondary enterprise. Example: A 150 H.P. tractor, with a cab, is used on occasion to haul manure in winter; charge only the operating costs to the livestock, as the operator would not have purchased the tractor if no cropping was done.

Unpaid labor & management (operator's salary):

This cost is extremely difficult to allocate when evaluating single enterprises. The living expense of the family (operator's salary) is a fixed outlay when looking at the total farm. It can come from many sources. This expense can be allocated to the various enterprises on the farm by percentage of income or expense, or by time spent on the enterprise.

This last calculation can be complicated by the relative value (opportunity cost) of each unit of time spent on various enterprises.

Also, the unpaid labor charge can be calculated by subtracting the paid labor from the amount of labor required by the enterprise and charging the difference to the enterprise.

Usually management is assigned a percentage of the revenues from the enterprise. The range is 5 -7 percent.

Additional Considerations

The cropping enterprise's output is in many instances an input to the same farm's livestock enterprise. Detailed production records must be kept to determine the cropping enterprise's operating profit and utilization records must be kept to determine the livestock enterprise's operating profit. These two sets of records must be reconciled. The total production of the cropping enterprise should equal the amount utilized by the livestock enterprises plus cash sales and inventory change.

In addition to problems in the assigning of yields, there can be problems in assigning prices to the cropping enterprise's outputs. *Relative long run prices should be used when doing a planning enterprise budget.* Actual prices should be used when doing a short run planning budget or a financial analysis enterprise budget. **The internal production cost of feed should <u>not</u> be used as the price of feed in a farm's livestock enterprise budgets** because it produces a livestock enterprise budget with the livestock output as a residual claimant. Residual claimant means that any profit (or loss) that the cropping enterprise had is now part of (claimed by) the livestock enterprise's profit (or loss).

Example: Suppose the long run average price of corn is $2.40 per bushel and this year you raised corn for $1.50 per bushel. If you feed 50 bushels of your raised corn, per head, to your steers and charge the steer enterprise a $1.50 per bushel for corn, you are stating that your corn enterprise is a zero profit enterprise. Also, you are transferring $45 (50 * ($2.40 - $1.50)) of profit per head from the corn enterprise to the steer enterprise.

Measuring the production of pasture is even more difficult than measuring the production of other cropping enterprises. It presents a unique problem because the pasture can not exist in the absence of a livestock enterprise and as such can not be separated out and analyzed as a distinct entity. Therefore, the property taxes, insurance, fencing, opportunity interest, land charge, and

other costs (or a proxy of the costs) associated with the pasture should be charged to the livestock harvesting the feed.

The transfer of feeder cattle, feeder pigs, dairy heifers, and other livestock between enterprises requires that those enterprises be separated out and analyzed as a distinct entity. This is possible on some farms. If so, it is desirable to credit the producing enterprise and charge the using enterprise a price as near as the long run market price as possible. Again, the internal production cost should not be used.

Salvage Feeds

Livestock sometimes utilizes salvage feeds. These salvage feeds would not be used if the livestock were not raised, therefore, the crop enterprise should not be credited for the salvage feed's value and a manure credit should not be taken by the livestock enterprise or charged to the cropping enterprise.

Fencing and other costs associated with harvesting the salvage feeds should be charged to the livestock enterprise.

Crop residue:

Crop residues should be credited to the crop that produced the residue and charged against the crop that uses the nutrients. Green manure crops should be charged against the crop using the nutrients.

Livestock waste:

Livestock provide manure for the cropping enterprises. Its value should be credited to the livestock enterprise and charged to the crop enterprise. The machinery costs associated with waste removal should be charged to the livestock enterprise.

Summary

Enterprise budgets can be used as a planning tool or an analysis tool. They can help the farm manager better understand the pros and cons of a component of their business. Producing sound enterprise budgets requires the author to have both a detailed understanding of an enterprise's production practices and an understanding of the basic budgeting framework.

Sound enterprise budgets provide more information than just the enterprise's profitability. They can identify the most profitable enterprises on a farm, provide the basis for partial budgeting and cost of production calculations, and be used to produce break-even price and/or production analysis, as well as sensitivity analysis price or production factors.

Appendix A

Capital Recovery Charge (CRC)

CRC is a proxy for the ownership costs of assets with a productive life of greater than one year. Assets that will be used in several production cycles need to have the cost of that item divided among the cycles (years). The CRC takes into account the ownership cost of an asset associated with obsolescence, depreciation, and interest on its value.

A typical CRC percentage for **equipment is 15%**, for machinery, 12.5%; and **buildings, 10%**. This is assuming a 10% interest rate. The CRC percentage is multiplied by the asset's value to obtain the CRC. A budget's author can either use these typical percentages or calculate a more accurate CRC using the following method.

The formula for periodic repayment of a loan is used to calculate the first part of the CRC. The second part is simple interest on asset's salvage value. These are added to obtain the total CRC.

$$\frac{i}{[1 - (1+i)^{-n}]} \text{ * Loan Amount} = \text{Payment per Period}$$

Where: i = Interest Rate Per Period
n = Number of Periods

When the asset's cost minus its salvage value is substituted for the loan amount in this equation the first part of the CRC can be calculated.

The second part of the CRC is the interest rate times the salvage value.

Example: a tractor purchased for $50,000. It has a useful life of 15 years and a salvage value of $10,000. The interest rate is 9 percent.

$$\frac{.09}{[1 - (1+.09)^{-15}]} = 0.1241$$ (Also, this value can be found in financial tables.)

Part 1	0.1241 * ($50,000-$10,000)	= $4,964
Part 2	+ 10,000 * .09	= $ 900
	Total CRC per year	$5,864

Now the $5,864 in CRC must be allocated among the enterprises using the asset.

The allocation of these fixed costs should be assigned by percentage of use in each major enterprise that requires the asset in question.

Example: If the tractor in the proceeding example is used 400 hours per year. It is used 100 hours in the snapbean enterprise. The amount of its CRC allocated to the snapbean enterprise should be $1,466 (100/400 times $5,864).