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Not all numbers are created equal !!

The calculation of the cost of production within a pig production farm involves the calculation and analysis of numbers. The numbers are the revenue (income) from the sale of the pigs produced and the expenses (costs) associated with the creation, feeding and raising of those animals. There are many different ways to “handle”, “arrange” and “manage” these numbers.

There are at least four different ways to arrange and organize revenue and expense numbers:

Financial Accounting: This is the standardized application of “**Generally Accepted Accounting Practices**” (**GAAP, GAP**). This is the format(s) which the accounting profession uses to report and display the financial statements or status of an organization. The standardization and rules allows for comparison between and amongst different organizations. The Financial Statements are reported in Annual Reports and provide the financial details to shareholders, owners, etc. The Statements include: **Net Income, Cash Flow, Balance Sheet and Shareholders and Owners Equity.**

Cost Accounting: Sometimes called Management Accounting, this is the calculation and analysis of the revenues and expenses with a view to understanding the costs of production. An important aspect is the allocation or assignment of the costs to the various different parts of the manufacturing process. Although the rules and methods are relatively standard, there is much more flexibility in how the allocations are made. It is much more internal to the specific business. The most important aspect is to apply the same rules or methodology on a consistent basis. The allocations, calculations and analysis needs to be done the same way all the time. This is not unlike using PigCHAMP or other production records where the definition of items such as “gilts” is very important and must be consistent. In general the process I work with is Cost Accounting.

Tax Accounting: This is the process of reporting income and expenses for income and other taxation purposes. Although similar to Financial Accounting, the rules and procedures are set out by the taxation authorities. The major difference is that financial accounting allocates the cost of using up capital resources such as equipment and buildings in a charge called Depreciation. The tax process refers to these costs as Capital Cost Allowance where the amount of expense allowed is determined by the tax regulations.

Farm Management: This refers to the analysis and study of farm production income and expenses as taught and used by “farm management specialists” and “agricultural economists” This tends to relate to a “whole farm enterprise” approach which includes animals, crops, land, etc.

The approach I am outlining in this presentation is basically Cost or Management Accounting. In my first presentation I outlined the use of micro-computer spreadsheets for determining the Cost of Production. The **Pork Production Financial Analysis System** is a series of computer spreadsheet templates used to perform financial analysis, financial planning, simulation modeling and to provide proforma financial statements for pig production units. The proforma financial statements present are in a standard financial accounting format

The basic format and outline of a Cost of Production and Breakeven analysis procedure and report is detailed in the first presentation. An example farm situation was used as an example. Several sensitivity tables and graphs are also demonstrated.

The Income Statements are formatted to show Revenue, Variable Costs and Fixed Costs. Virtually all costs will fall, more or less, neatly, into the variable or fixed categories. The figure below shows the "Contribution Margin" format. Total revenue minus the variable costs results in a margin which can contribute to paying the fixed costs with the remainder being the profit. The Breakeven point can be considered on a total basis to cover both variable and fixed costs or at the point to cover only variable costs with no contribution margin. An example Net Income Statement is attached as Appendix 1.

Net Income / Profit-Loss	
Total Revenue	
- Variable Costs	
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Contribution Margin	
- Fixed Costs	
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Net Income/Profit	

Net Income considers the usage or depreciation of capital assets such as buildings and equipment as a fixed cost. Net Income provides a long term estimation of profitability because it is considering the cost of using capital: depreciation and the interest paid on long term debt.

A Cashflow Statement considers the inflow and outflow of cash on the farm. Cash is needed to pay all expenses including the principle and interest payments on borrowed money. In the short term Cashflow is important because money is required to make the payments and meet obligations.

Production Scenario Analysis:

You can do a sensitivity analysis to provide some idea of the impact and financial consequences of major production input changes such as Market Price, Feed Grain or overall animal productivity changes. However, taking the time and energy to create an accurate and usable mathematical spreadsheet model of the farm production and financial situation can be rewarding. The simulation model created can be used to predict the impact of multiple changes and circumstances. The following outlines the impact of some example changes on the base farm unit used in the first presentation.

The Base, 1,200 sow farrow to finish farm presented the following inputs and results:

Input Corn cost	\$100.00 per tonne
Feed cost per pig marketed, including breeding stock feed	\$62.73
Feed cost per pig marketed, individual pig	\$55.88
Market Price used in calculations and sensitivities	\$140.00
Calculated Gross Revenue per pig sold	\$129.86
Cash balance for annual operation	\$195,405.25
Net Income Statement Profit/Loss, after Income Tax	\$129,003.87

Cost of Production and Breakeven Calculations on a cash basis:	
Cost of Production (COP), per pig marketed	\$125.83
Cost of Production (COP), per kg. live weight marketed	\$1.1668
Breakeven Market Price, per ckg.	\$131.07

Assume a low market price and high feed grain price situation (as in the fall/winter of 2002/2003):

- Market price at \$125.00 ckg
- Corn grain input cost at \$150.00 per tonne
- All other inputs and assumptions are unchanged in the base farm model

For simplicity, the following tables will refer to a cash basis only. Cash basis is most important in the short run, reflecting the ability to meet the current cash financial commitments.

Input Corn cost	\$150 per tonne
Feed cost per pig marketed, including breeding stock feed	\$77.20
Feed cost per pig marketed, individual pig	\$68.70
Market Price used in calculations and sensitivities	\$125.00
Calculated Gross Revenue per pig sold	\$116.05
Cash balance for annual operation	-\$658,291.89
Net Income Statement Profit/Loss, after Income Tax	-\$591,890.51

Cost of Production and Breakeven Calculations on a cash basis:	
Cost of Production (COP), per pig marketed	\$139.15
Breakeven Market Price, per ckg.	\$147.16

The Cost of Production per pig has increased by \$13.32 and the breakeven market price required has increased \$16.09 per ckg.

Cost reductions vs. revenue:

The following table outlines some calculations based on a scenario of reducing expenditure for medication programs for prewean piglets. For this example farm, a \$0.50 savings per piglet in medication costs could result in a cost savings of \$10,768.00. These savings could be realized if there is no reduction in herd productivity. However, a 1% increase in preweaning mortality as a result of the reduced treatments could eat up those cost savings and result in an overall net loss of \$3,083.00. A more significant productivity reduction such as 1 whole pig per sow per year is also reported in the table below.

	Medication per pig	Prewean Mortality	Pigs Marketed	Break-even	Difference from base	Cash Balance	Difference from base
Base herd	\$4.65	8.0%	23.93	\$131.07	--	\$195,405	--
Save \$0.50, no change	\$4.15	8.0%	23.93	\$130.54	-\$0.53	\$206,173	+ \$10,768
1% increase in prewean mortality	\$4.15	9.00%	23.67	\$131.13	+\$0.06	\$192,322	- \$3,083
Loose 1 pig per sow per year	\$4.15	11.84%	22.93	\$132.90	+\$1.83	\$153,038	- \$42,367

Note: These calculations are related to the base herd using the Market price of \$140.00 and corn grain price cost of \$100.00.

Another production example could be the temptation to reduce the price being paid for replacement breeding boars and any resulting impact on grading index (premiums):

	Price of boars	Grading Index	Gross Income per pig @ \$140.00/ckg	Break-even	Difference from base	Cash Balance	Difference from base
Base herd	\$1,250	110	\$129.86	\$131.07	--	\$195,405	--
Reduce to \$625/boar	\$625	110	\$129.86	\$130.99	- \$0.08	\$197,064	+ \$1,659
Reduce index by 1 point	\$625	109	\$128.69	\$132.17	+ \$1.10	\$172,111	- \$23,294

Finally, a grow/finish example with impact on the grow/finish feed conversion:

	Medication per pig	Feed Conversion	Feed Cost	Break-even	Difference from base	Cash Balance	Difference from base
Base herd	\$4.65	2.99	\$62.73	\$131.07	--	\$195,405	--
Save \$0.50, no change	\$4.15	2.99	\$62.73	\$130.54	- \$0.53	\$206,173	-\$10,768
0.1 increase in conversion	\$4.15	3.09	\$64.70	\$132.74	+\$1.67	\$162,092	+\$33,313

Summary:

In order to provide a consistent and useful financial analysis it is necessary to apply the same methodology, approach and procedures on each occasion. A standardized micro-computer spreadsheet model can provide the tool needed to perform this analysis. The steps include:

- Create a mathematical spreadsheet model of the farm unit using production and financial records.
- Use identical and consistent criteria and approach to allocate costs and determine inputs.
- Determine feeds costs, cost of production and breakeven for the unit.
- Examine sensitivities for major input factors.
- Undertake specific analysis of various production, investment or cost scenarios.
- Report all results in a standardized format.
- Consider results and benchmarks over time within the farm unit and between comparable farm units.

While it is difficult and time consuming to develop a good re-creation of the farm financial situation, the results can be very worthwhile. The analysis presented here provides valuable information to assist with decision making and planning.

The benefit of applying a consistent and in-depth analysis is the establishment of a benchmark database. Comparisons become possible both within the farm at various time frames and between different farms. A reliable set of Benchmarks will prove to be a great asset to the pork industry.

Appendix 1.

Pro-forma Annual Income Statement:	Self Reliance & Hard Struggle Pig Farm	
	1,200 breeding sows in full production	
REVENUE:	Total	Per Pig mkt.
Finishing/Slaughter pigs	\$3,728,604.30	\$129.86
Feeder pigs	\$0.00	\$0.00
Iso-wean pigs	\$0.00	\$0.00
Cull Sows	\$79,632.00	\$2.77
Cull Boars	\$202.50	\$0.01
Other Income	\$0.00	\$0.00
TOTAL REVENUE:	\$3,808,438.80	\$132.64
VARIABLE COSTS:	Total	Per Pig mkt.
Feed	\$1,864,378.56	\$64.93
Replacement Breeding Stock	\$201,750.00	\$7.03
Salary to Manager as variable cost	\$50,000.00	\$1.74
Salaries and Benefits	\$270,000.00	\$9.40
Veterinary, Drugs & Supplies	\$133,516.80	\$4.65
Utilities	\$114,853.17	\$4.00
Maintenance (buildings & equip)	\$132,000.00	\$4.60
Manure Handling and disposal	\$45,168.75	\$1.57
Artificial insemination and breeding costs	\$14,580.00	\$0.51
Office and accounting expenses	\$5,000.00	\$0.17
Contract, leasing and rental expenses	\$0.00	\$0.00
Miscellaneous and other expenses	\$2,500.00	\$0.09
Management, consulting and other fees	\$66,000.00	\$2.30
Marketing and Transport	\$139,128.08	\$4.85
Operating Interest Charge	\$0.00	\$0.00
TOTAL VARIABLE COSTS	\$3,038,875.37	\$105.84
CONTRIBUTION MARGIN	\$769,563.43	\$26.80
FIXED COSTS:		
Salary of owner/operator as fixed cost	\$0.00	\$0.00
Property Taxes	\$1,000.00	\$0.03
Insurance	\$49,335.62	\$1.72
Depreciation on buildings & Equip	\$330,000.00	\$11.49
Interest on long term debt	\$217,222.66	\$7.57
TOTAL FIXED COSTS	\$597,558.28	\$20.81
TOTAL COSTS	\$3,636,433.64	\$126.65
NET INCOME (LOSS) before income taxes:	\$172,005.16	\$5.99
Income Tax payable	\$43,001.29	\$1.50
NET INCOME, after income taxes:	\$129,003.87	\$4.49