

Measuring agricultural performance and finance



Department of
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Measuring agricultural performance and finance

An understanding of managing agricultural finance is integral to farm management and a requirement of the NSW Agriculture syllabus. The following resource provides engaging authentic learning activities to develop and challenge student understanding of the concepts. This resource addresses the NSW Agriculture Syllabus Stage 6 Farm Case study outcomes, with cross curricular connections.

Outcomes:

P1.1 describes the complex, dynamic and interactive nature of agricultural production systems

P1.2 describes the factors that influence agricultural systems

There are many features to a farm business that producers need to manage, including financial, physical, environmental, animal welfare, risk management, workplace health and safety and marketing. Agricultural productivity is essentially measured as the ratio of agricultural outputs to agricultural inputs.

Integral to effective farm business monitoring is identifying appropriate farm performance indicators to record and monitor. Selection of performance indicators is dependent on the farm business plan and information should be drawn from performance in production, marketing, finance, people and resources.

Production performance indicators are specific to the particular enterprise. In livestock enterprises these include yield measurements such as: calving or lambing percentage, weight gain for age, live weight, milk production/cow, milk composition, kg fleece, mortality%, no eggs. In plant production enterprises production indicators include: yield kg/Ha, yield kg/mega Litre water and other yield and quality measurements.

Marketing performance indicators are again chosen dependent on farm enterprises. Examples could include quality aspects such as micron, genetics, fat (mm), fleece tenderness, absence of weeds and contaminants, moisture content, Protein %, customer satisfaction, minimisation of costs associated with transport, storage and selling.

In finance performance standard measures of whole farm performance include:

- Partial budgets,
- Whole farm budgets,
- Development budgets,
- Cash flow budgets,
- Profit and loss statement: includes all income earned from farm operations and all costs. It is different to the cash flow budget because it includes depreciation and accrued value of inventory. However unlike a cash flow budget it does not include personal and off farm income, personal expenses, income tax and capital sales and purchases.
- Net worth or equity %: Equity% is equity or net worth expressed as a percentage of total assets. It equals all assets minus liabilities. It is a good financial indicator for the risk of a property.

$$\frac{\text{Equity or Net worth}}{\text{Total assets}} \times 100$$

» Benchmarks: >70%

- Return to capital (%): measures the financial return (profit) achieved relative to how efficiently the farms resources (assets) are allocated and used. Return to capital excludes personal factors such as taxation living expenses etc.

$$\text{Operating profit} = \text{Profit} - \text{Cost of operators labour or management}$$

$$\text{Percentage Return to capital} = \frac{\text{Operating Profit}}{\text{Total assets}} \times 100$$

» Benchmarks: Weak < 2 % Average 2 % to 6 % Strong > 6 %

- Gross margins: (enterprise budgets) are used to measure and compare performance of individual enterprises, not whole farm performance.

Activities:

Follow this link to the DPI link "[About gross margin budgets](#)" to learn more and complete the following:

1. Define partial budget.

2. Define whole farm budget.

3. Define development budget.

4. Define cash flow budget.

5. Contrast differences between cash flow budgets and profit and loss statements.

6. Which financial measurement is a good financial indicator of the risk level of a property and identify the benchmark.

7. Financial information for a farm is shown.

Land Value	\$1 500 000
Livestock and machinery	\$1 500 000
Living Expenses	\$300 000
Annual Farm Income	\$500 000
Annual Farm costs	\$260 000

a) What is the return to capital% for this farm?

b) Rate the farms return to capital using the benchmark.

8. Write the equation to determine a gross margin.

9. Define variable costs.

10. Does a gross margin reflect profit? Explain.

11. List the various unit of measurement to determine gross margins to e.g./Ha

12. Describe what a gross margin enables a producer to compare?

13. What are the limitations of a gross margin?

14. Variable costs are specific to an enterprise. Fixed or overhead costs affect the whole farm and are not dependant on the enterprise type. From the following list:

- » Cross out the fixed costs and
- » Highlight the variable costs for a beef production enterprise.
- » Underline the variable costs not specific to beef

Vet costs for heifer AI program	Electricity
NLIS tags	Depreciation on machinery and structures
Telephone	Contract harvesting
Hay for cattle	Molasses licks for calving cows
Replacement heifers	Stationery
Wheat cartage grading and packing	Cartage for heifers
Labour	Crop insurance
Copper capsules for weaner cattle	Bovine 5-in-1 Vaccination
Replacement bulls	Herbicides
Magnesium blocks for lambing ewes	Insurance
Fuel	Workers Compensation
Livestock pellets	Replacement ewes
Rates	

15. A list of entries being compiled for a gross margin for the **Total dairy production enterprise** is shown.

a) Identify variable costs relevant for the gross margin.

b) Calculate the total variable costs

Identify Variable Costs	Value
AI semen	\$12,000
Day old chicks	\$5,000
Cattle Sales	\$76,520
Supplementary feed- dairy grain \$300/t @ 100t	\$30,000
Supplementary feed- dairy hay \$200/t @ 100t	\$20,000
Freight for feed \$50/t @ 200	\$10,000
Freight for milk	\$18,000
Tractor and vehicle maintenance	\$8,000
Electricity/quarter	\$22,000
Dairy pasture costs	\$110,000
Total Variable Costs	

16. Complete the following Beef Cattle Gross Margin (Adapted from NSW DPI, 2017)

BEEF CATTLE GROSS MARGIN BUDGET			
Enterprise: Feeder steers			
Enterprise Unit: 100 cows			
Pasture: Native pasture			
INCOME:			
Description	\$/Head		Total
38 steers 18 months @	\$1,518		\$57,684
4 steers 20 months @	\$1,518		
22 heifers 9 months @	\$756		
1 CFA Bull @	\$1,665		
7 CFA cows @	\$1,163		
11 Other culls @	\$1,163		
		(A) Total Income:	
VARIABLE COSTS:			
Replacements 1 Bull @	\$7,000 /hd		\$7,000
Livestock and vet costs:			
Pestigard (pestivirus vaccinations) @164 head	\$4.50/dose (2x)		
Leptospirosis vaccinations (7 in 1 instead of 5 in 1) @180 head	\$2.00/dose (1x)		\$360
Piliguard (pinkeye vaccinations (excluding early weaned calves) 130	\$4.60/dose (1x)		
Fertility tests for bulls	\$250/2 bulls		\$500
Ear tags @ 40	\$2.00/head		
Fodder crops / hay / grain / silage	\$0		
Drought feeding costs.	\$0		
Pasture maintenance 424 Ha native pasture	\$0		
Livestock selling cost (see selling cost note below**)	\$6,742		\$6,742
		(B) Total Variable Costs:	
		(C) Gross Margin (A-B)	
		Gross Margin/COW	
		GROSS MARGIN/DSE*	
		GROSS MARGIN/HA	
Additional Information			
**(Commission 4%, yard dues \$3.00/hd, MLA levy \$5/hd, average freight cost to saleyards \$15.00/hd; NLIS tags @ \$3.60 for all sale cattle)			
DSE rating per cow, around 14.8. (DSE calculated with C/DSE/ # Cows) This is an average figure and will vary during the year.			
Gross margin per DSE is a comparison of the best returns that can be achieved per unit of energy requirement and so allows comparison with other animal enterprises.			

17. Complete the following Wheat Gross Margin (Adapted from Farm Gross Margin and Enterprise Planning Guide 2017)

WHEAT GROSS MARGIN BUDGET			
Enterprise: Wheat			
Enterprise Unit: 500 acres			
Grade/ Variety : APW Medium/ Sunstate			
INCOME:			
	Description	\$/Ha	Total
	2.7 tonnes/Ha	\$225	
			(A) Total Income:
VARIABLE COSTS:			
	Seed	Rate (kg/ha)	
	Seed (\$0.22/kg) @	80	
	Seed Treatment(1) (\$0.04 /kg) @	80	
	Levies		
	GRDC Levies 1.0% Gross or Total Income (A)		
	Fertiliser (Bulk)		
	18:20:0 \$550 /tonne @	60	
	Urea \$440 /tonne @	80	
	Chemicals-Herbicides		
	Glyphosate 540 \$6.00 /litre @	1.2	
	Topik (3) \$37.70 /litre @	0.085	
	Affinity@ \$125.00 /litre @	0.1	
	MCPA Amine (750g/L) 8.95 /litre @	0.33	
	Operations		
	Fuel & Oil	\$12.13	
	Repairs & Maintenance	\$17.60	
	Freight		
	Grain (t) @\$20/t	2.7t	
	Fertiliser (t) @\$20/t	1.6t	
	Contract Work		
	Aerial spraying @ \$14.00/Ha		
	Urea spreading @ \$8.50/Ha		
			(B) Total Variable Costs:
			(C) Gross Margin (A-B)
			Gross Margin/Ha
Additional Information			
1HA = 2.47 acre			

References and Further Reading:

About gross margin budgets

Scott F, 2017, NSW Department of Primary Industries, <https://www.dpi.nsw.gov.au/agriculture/budgets/about>, viewed 8 February 2018

AgGuide -How to write a business plan and review farm performance

Walsh, B 2010, 'AgGuide - How to write a business plan and review farm performance', NSW Department of Primary Industries, Tocal College



ESRI Story Maps

Hathway, J 2017, NSW Department of Primary Industries, Tocal College, <https://trade.maps.arcgis.com/apps/MapSeries/index.html?appid=54c8fa832fc445d8a8994e4731956e0a>, viewed 8 February 2018

Farm gross margin and enterprise planning guide

PIRSA, SAGIT, GRDC, 2017, Rural Solutions SA PIRSA, Grains Research and Development Corporation, <https://grdc.com.au/resources-and-publications/all-publications/publications/2017/02/farmgrossmarginguide2017>, viewed 20 February 2018

Inland weaner beef gross margin budget

Andrews, T 2017, NSW Department of Primary Industries, Farm Enterprise Budget Series, <https://www.dpi.nsw.gov.au/agriculture/budgets/livestock>, Viewed 20 February 2018

Tocal Property and Farms

Hathway, J 2017, NSW Department of Primary Industries, Tocal College, <https://www.tocal.nsw.edu.au/tocal-farms>, viewed 8 February 2018



Target Outcomes

Outcomes	Content
P1.1 describes the complex, dynamic and interactive nature of agricultural production systems P1.2 describes the factors that influence agricultural systems	<ul style="list-style-type: none">• identify various measures of performance including gross margins, yield, profitability

Additional Outcomes

Agriculture Stage 6- HSC

Outcomes	Content
H3.1 assesses the general business principles and decision-making processes involved in sustainable farm management and marketing of farm products	<ul style="list-style-type: none">• use techniques to analyse the financial situation of a farm enterprise including calculating gross margin and return to capital

Agriculture Stage 4-5

Outcomes	Content
5.4.2 evaluates management practices in terms of profitability, technology, sustainability, social issues and ethics	<ul style="list-style-type: none">• compare profitability using tools such as gross margins