DO LIVESTOCK SYSTEMS ACT AS A BUFFER AGAINST INCOME VOLATILITY?

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TAKE HOME MESSAGES

- The most profitable Wimmera and Mallee farming system typically comprises 75 per cent of the farm in-crop and 25 per cent non-cropped, with some livestock.
- Livestock income is less volatile than crop income, but increasing livestock income does not greatly reduce farm income volatility.
- Farmers can improve farm profitability by improving livestock productivity.

KEY WORDS

Farm profitability, financial summary, livestock, Mallee, mixed farming, Wimmera.

BACKGROUND

The most profitable farming system for Wimmera and Mallee environments has been long debated by farmers across the region. While some hold steadfast in their belief that fully cropping their land is the best option, others argue that a livestock enterprise reduces income volatility and risk. They contend that livestock can provide opportunities to generate income from out of phase cropping paddocks as well as offering alternatives when prices are depressed or effective liquidation of capital is necessary.

However, different livestock enterprises have different risk profiles and interact differently with the cropping side of the farm business. There is a need to better understand the mechanisms of risk management and how livestock can be more effectively managed to reduce overall business risk.

Using data collected by Ag Profit™ (a GRDC-supported initiative which provides an independent 'data house' that collects, stores, analyses and reports on a wide range of farm performance data to individual farm businesses, their advisors and the wider agricultural industry), this study measures the financial impact of a livestock enterprise on the whole farm. It also tests the long-held perception that running livestock offers a buffer against income fluctuations that result from seasonal volatility and that having livestock generally equates to lower total business costs.

AIM

To quantify the role of livestock on the financial performance of Wimmera and Mallee farming systems.

METHOD

Farm data was collected by Ag Profit™ from 251 businesses in the Wimmera and Mallee region. To meet the specific criteria of this study, data from only 88 of the farm businesses was analysed.

Businesses that were excluded from the data set included southern Wimmera farms due to their higher rainfall; organic producers and irrigators; and businesses with studs or piggeries.

Data was recorded for up to ten years for the financial years 2002/03 to 2011/12. However, the analysis was finalised using the period spanning 2005/06 to 2011/12 to ensure a more complete data set. Seven year averages were calculated using figures from within these years.

The data collected and recorded by Ag Profit™ included income and costs as documented in annual financial statements and tax returns (values were not adjusted for changes in inventory).

Overhead costs, farm input costs, machinery costs and labour costs were included; as a sum, these are referred to as total farm operating expenses. Finance costs were not included in total farm operating expenses as they can be influenced by factors such as an owner's stage of life (e.g. an owner nearing retirement as compared with a young farmer starting his or her career) and/or succession planning issues (e.g. debt incurred to buy out a relative's share of estate as opposed to farm gifted as part of inheritance).

Labour costs included an allowance for annual work hours provided by family members. An estimated cost of family labour was calculated from the hours worked multiplied by an hourly rate that varied with work category.

Land use data included paddock names and areas, annual land use, annual land value and ownership status (including share farm percentage). This information was used to determine effective and non-effective hectares. Effective hectares included owned and leased land plus a farmer's share of share-farmed land less non-productive hectares. Non-effective hectares included non-productive areas not used for broadacre farm production (e.g. houses, laneways, and treed areas). For some calculations, the effective hectares were split into crop hectares (land used for cropping) and non-crop hectares (land not used for cropping).

Table 1. Average effective hectares for each of the study groups.

	Livestock <5%	Livestock 5-19%	Livestock >19%	Top 20% profit
Crop (ha)	2,271	1,692	1,127	1,481
Non-crop (ha)	516	523	434	491
Total effective area (ha)	2,787	2,215	1,561	1,972

Study groups were created based on seven year average indicator values.

Livestock groups were defined according to the percentage of farm income received from livestock (livestock sales minus purchases plus fleece income).

Three livestock groups were formed and included:

- Livestock <5% (livestock income represents <5% of total farm income)
- Livestock 5-19% (livestock income represents 5-19% of total farm income)
- Livestock >19 % (livestock income represents >19% of total farm income)

It should be noted that even the businesses with the greatest focus on livestock (i.e. >19% livestock income) maintained a high crop intensity (72%), which indicates that cropping remains the main land use for most farms in the sample.

Table 2. Average crop intensity for each of the study groups.

% of effective ha	Livestock <5%	Livestock 5-19%	Livestock >19%	Top 20% profit
Cereals	61	52	52	51
Oilseeds	5	5	3	6
Legumes	12	15	9	14
Hay	3	5	8	4
Non-crop	19	24	28	25
Crop intensity	**82**	**76**	**72**	**75**

A fourth group formed for this study was titled the 'Top 20% profit group'. This group included the top performing businesses according to their 'farm operating profit per effective ha indicator', irrespective of their livestock income.

Averages were calculated on a denominator weighted basis. This means that businesses with bigger areas have a greater impact on the $/ha averages for each group.

RESULTS AND INTERPRETATION

Income

Between 2005/06 and 2011/12, average annual farm income dropped as the percentage of livestock income increased (Figure 1).

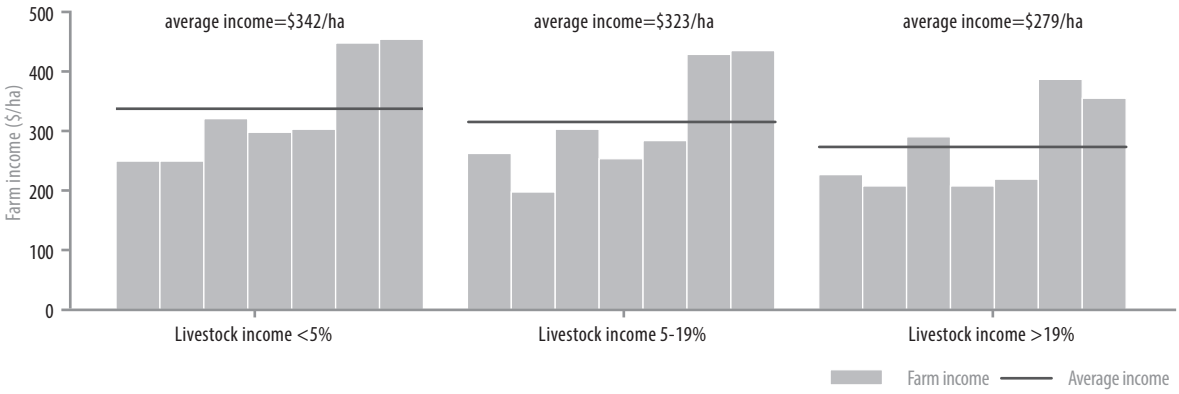

Figure 1. Annual and average farm income ($/effective hectare) for the three livestock groups from 2005/06 to 2011/12.

Annual income fluctuation and standard deviation (squared difference from the mean average income) for each group's average over the seven year period were similar. Standard deviation for the livestock >19% group was $77/ha compared with $87/ha for <5% group and $91/ha for the 5-19% group. While a weak trend towards lower income volatility was revealed in farms with more livestock, the findings overall contradict the common perception that livestock plays a large part in reducing income volatility.

There was, however, a notable difference between the average income of the top 20% profit group and the other groups (Table 3). The difference was again apparent when income generated from crops and livestock was compared (Table 4). This analysis measured income achieved from cropping per crop hectares and income achieved from livestock per non-crop hectares (calculated using figures from Table 1 (ha) and Table 3 ($)).

Table 3. Average farm income for each of the study groups (measured as $ per total effective hectares).

$/effective ha	Livestock <5%	Livestock 5-19%	Livestock >19%	Top 20% profit
Crop	325	284	202	**391**
Livestock	5	31	71	**22**
Other farm	12	8	6	**10**
Farm income	**342**	**323**	**279**	**423**

Table 4. Average crop and livestock income for each of the study groups (measured as $ per crop hectare and $ per non-crop hectare, respectively).

	Livestock <5%	Livestock 5-19%	Livestock >19%	Top 20% profit
Crop income ($/crop ha)	399	372	280	521
Livestock income ($/non-crop ha)	27	131	255	88

Note that while the livestock >19% group achieved the greatest livestock income per non-crop hectare, the crop income per crop hectare was the lowest of all four groups. This suggests that the livestock enterprise may be compromising the farmer's income from the cropping enterprise. However, this needs further investigation.

Farm operating expenses

Across all of the livestock groups, total farm operating expenses were similar (Figure 2). Again, these findings go against the common perception that suggests an increase in livestock income equates to a reduction in total farm operating expenses. The data also reveals that businesses in all groups adjust costs annually as income fluctuates. This reflects the practice of reducing costs in poorer seasons and spending more in the 'catch-up' years.

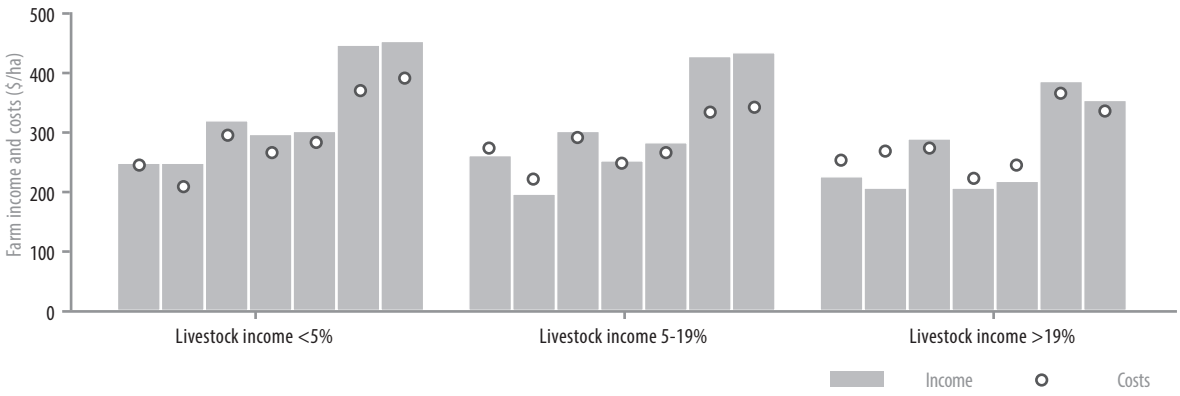

Figure 2. Annual farm income and farm operating expenses (costs) per effective hectare for the three livestock groups from 2005/06 to 2011/12.

Further investigation into the types of costs that contribute to total farm operating expenses (Table 5, 6, and 7) revealed the following points:

- The top 20% profit group spends the most on farm inputs, suggesting that inputs need to be maintained to achieve a high production and income level.
- The amount spent on machinery is similar across the groups. This may be due to the high crop intensity levels across all groups (Table 2), and the subsequent need for all farm businesses to maintain machinery to a good standard. Again this challenged a common perception that those with more livestock have lower machinery costs.

- The >19% livestock group had the highest labour cost and there was a trend towards more family labour and less employed labour. Additionally, the farms within the >19% livestock group tended to be smaller (Table 1) than the farms within the other groups. From this it can be hypothesised that running some livestock may help justify an extra family labour unit, enabling more family members to return to, and be supported by, the farm business.

Table 5. Average farm input expenses for each of the study groups (measured as $ per effective hectares).

$/effective ha	Livestock <5%	Livestock 5-19%	Livestock >19%	Top 20% profit
Fertiliser	44	39	31	**47**
Sprays	53	44	31	**53**
Seed	10	8	5	**10**
Fodder/agistment	1	2	6	**1**
Other input costs	1	3	8	**2**
Farm input expenses	109	96	81	**113**

Table 6. Average farm machinery expenses for each of the study groups (measured as $ per effective hectares).

$/effective ha	Livestock <5%	Livestock 5-19%	Livestock >19%	Top 20% profit
Fuel	27	25	22	**23**
Repairs	17	18	17	**15**
Other (freight)	15	14	17	**17**
Contracting	6	11	16	**4**
Net depreciation	43	37	33	**41**
Machinery expenses	108	105	105	**100**

Table 7. Average farm labour expenses for each of the study groups (measured as $ per effective hectares).

$/effective ha	Livestock <5%	Livestock 5-19%	Livestock >19%	Top 20% profit
Employed labour	12	11	7	**6**
Contract labour	4	5	5	**8**
Family labour	40	47	59	**53**
Labour expenses	56	63	71	**67**

This comparative study found that as the percentage of income from livestock increases, the farm input costs reduce (particularly fertiliser and chemical costs). Labour costs, however, are higher when running livestock and these higher costs are not offset by savings in machinery costs. Consequently, as demonstrated in Figure 2 and Table 8, total farm operating expenses are similar across all groups.

Farm profit

Across all livestock groups, as the percentage of livestock income increased, farm profits declined. Yet while the top 20% profit group had similar spending (expressed as farm operating expenses) to the other livestock groups, they managed to generate more profit from their cropping and livestock enterprises (Table 8).

Table 8. Average farm profit for each of the study groups (measured as $ per effective hectares).

$/effective Ha	Livestock <5%	Livestock 5-19%	Livestock >19%	Top 20% profit
Farm income	342	323	279	**423**
Less				
Overheads	28	27	30	**29**
Farm inputs	109	96	81	**113**
Machinery	108	105	105	**100**
Labour	56	63	71	**67**
Farm operating expenses	301	291	287	**309**
Farm profit	41	32	-8	**114**

COMMERCIAL PRACTICE

The results from this study indicate that, over the last seven years, having a livestock enterprise was not the driver of overall profit on farms in the Wimmera and Mallee.

Farmers in the top 20% profit group are achieving most of their income from their cropping enterprise rather than their livestock enterprise ($521/crop hectare versus $88/non-crop hectare). Additionally, contrary to popular belief, livestock were not shown to act as a buffer against volatility or to reduce total farm operating expenses.

Despite these findings, it is evident that there exists a gap between what can be achieved from livestock production and what is being achieved (Table 4). From these results, it is apparent that there is an opportunity for livestock production to improve and profit to increase across all groups, including those farmers already in the top 20% profit group.

The farmers in the top 20% profit group are achieving the majority of their profits using 75 per cent of their land resources (cropping intensity = 75 per cent). This suggests there is an opportunity to re-focus on the productivity and management of livestock on the remaining 25 per cent of their land resource to improve whole farm profitability. However, as cropping has been shown to be the main driver of farm income (and profit), improvements to livestock production must and can be achieved without jeopardising the cropping enterprise.

This comparative study focused on the role of livestock in whole farm performance and has shown:

- The Wimmera and Mallee farming systems that achieved the highest profits typically operated with approximately 75 per cent cropping and 25 per cent non-cropped, with some livestock.
- Livestock income is less volatile than crop income. However, the reduction in farm income volatility as livestock income increases is not as large as anticipated.
- Farms with livestock use fewer herbicides, livestock being effective as a tool to delay the development of herbicide resistance in crops.
- Labour costs are higher when running livestock and are not offset by savings in machinery costs.
- Livestock do not substantially decrease total farm operating expenses; extra labour costs offset potential reduced input costs.
- The most profitable farms are not making their profit from their livestock enterprise. Livestock were not shown to heavily influence the farm businesses' bottom lines, but increasing income from livestock may improve whole farm profitability.

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