COSTS OF AND RETURNS FROM PERFORMANCE RECORDING IN BEEF AND SHEEP STUDS

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SUMMARY

Genetic improvement of the Australian beef herd and sheep flock depends heavily on investment by stud producers in performance recording. A survey was conducted to estimate levels of investment and profitability in beef and sheep studs in Australia, and to assess whether these differed between studs using BREEDPLAN or Sheep Genetics and those not. A voluntary survey was developed and invitation to participate widely circulated. The participation rate was low, but participants included a sample of the largest users of BREEDPLAN and Sheep Genetics. Results suggest that BREEDPLAN and Sheep Genetics users have larger businesses in both scale and level of investment, and those businesses are more profitable, than non-users. Knowledge of operating margins and return on investment is valuable in understanding seedstock sector capacity to increase investment, particularly in hard-to-measure traits and genotyping. On the basis of the results here, such capacity appears likely to be constrained. Obtaining more comprehensive survey results would be valuable, but it is not obvious how to achieve that.

INTRODUCTION

Commercial sheepmeat and/or grassfed beef producers derive their long-term genetic improvement from ram and bull breeders, and the higher the rate of genetic progress those breeders can achieve, the better the commercial producers are able to meet or beat the cost-price squeeze. An essential ingredient of achieving high rates of genetic gain in the ram- and bull-breeding enterprises is the investment in performance recording both on- and off-farm. How much the ram- and bull-breeder are prepared to invest must depend in part on their operating margins – the costs of recording have to be covered by sales of bulls and rams.

Particularly as breeding moves more fully into the genomics era, the demand for high quality recording will rise. This is because of the dependence for genomic prediction on the existence of a reference population, which should be recorded for all traits in the breeding objective. Archer *et al*. (2004) estimated performance recording costs in beef seedstock businesses in Australia, but no comprehensive data on the costs of recording, of operating margins for breeders, and the variation in those costs and margins, is available. This is important information for the industry, since the levels of these parameters will influence the capacity of the ram- and bull-breeding sectors to scale up investment in recording, particularly for hard-to-measure traits. If that capacity is limited, this will place limits on the accuracy of genomic selection that can be achieved.

This project aimed to inform industry about the average of and variation in investment levels in recording costs and in operating margins. This knowledge could potentially assist in developing strategies for increasing adoption of genomic technologies. If it is the case that there is limited scope for increasing volume and quality of recording, this will limit the benefits that can be delivered to the commercial production sector, and accordingly, novel mechanisms to facilitate increased recording may need to be considered.

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MATERIALS AND METHODS

A survey was developed with inputs from ABRI and Sheep Genetics staff, and an invitation to participate in the survey distributed widely through breed societies in sheep and beef cattle, through ABRI outlets, via Sheep Genetics and via sheep Breed Societies. The survey questions covered:

- Scale of business, including number of breeding females and numbers of rams and ewes sold
- Returns from sales, both per unit of genetic material sold and in total
- Operating costs including both variable costs and overheads including plant and equipment
- Level of recording and associated costs
- Participation or not in BREEDPLAN and Sheep Genetics

The survey included up to 82 items of information (sheep) and 42 items of information (beef), and 18 questions directly relating to income or costs.

The initial aim was to obtain data from 300 studs in each of beef and sheep, including at least 30 in each species not using BREEDPLAN or Sheep Genetics. With the aim of increasing participation rate, direct calls were made to 1,450 sheep studs (605 Merino, 539 Dorset and Poll Dorset, 134 Suffolk, 178 Border Leicester) and 1,670 cattle studs (197 Hereford, 307 Angus, 143 Simmental, 215 Charolais, 157 Santa Gertrudis, 2,633 Brahman, 157 Droughtmaster, 189 Brangus and 52 Braford), and the survey sent directly to over 350 sheep studs and 200 cattle studs.

RESULTS AND DISCUSSION

Survey participation. Response to the survey was not as high as hoped. Invitations to participate were distributed twice, based on limited response to the first call. In total, 68 responses were received from beef studs, and 81 from sheep studs, including 26 and 51 from non-BREEDPLAN and non-Sheep Genetics users respectively. The number of respondents not using BREEDPLAN or Sheep Genetics were close to or more than the targets for these groups. Numbers of respondents from BREEDPLAN or Sheep Genetics users were much smaller than the target.

These overall response rates (around 4% of BREEDPLAN and Sheep Genetics users) are lower than the levels quoted as typical for surveys (10-15% for external surveys of values, political opinions etc). This may reflect the amount and/or nature of the questions. Despite the low response rate, the survey results provide some basis for estimating investment levels and return on investment for the larger users of BREEDPLAN and Sheep Genetics. The herd and flock size distributions among participants are similar to those of the largest 10-15% of all BREEDPLAN herds and 25-30% of all Sheep Genetics users.

Characteristics of seedstock businesses. Table 1 includes data on scale and financial parameters of the 4 categories of businesses.

In both species, the most obvious feature is that businesses that utilise the industry genetic evaluation systems are significantly larger than those that don't, and that levels of investment are higher, and value of sales are higher. Together these translate into clear differences in levels of profitability. In both species, the most obvious feature is that businesses that utilise the industry genetic evaluation systems are significantly larger than those that don't.

Table 1. Key scale and financial parameters of businesses surveyed

Parameter	Beef		Sheep	
	In BREEDPLAN	Not in BREEDPLAN	In Sheep Genetics	Not in Sheep Genetics
Females per herd or flock	270	40	559	381
Bulls or rams sold per year	81	10	151	63
Bulls or rams sold per breeding female per year	0.30	0.26	0.27	0.17
Average total operating costs	$242,669	$67,795	$100,977	$56,121
Total performance recording and genetic evaluation costs	$65,530	$1,468	$4,351	$704
Average sale value of sales of bulls or rams	$5,103	$2,452	$1,089	$729
Total value of sales (includes semen and females)	$511,034	$36,896	$214,192	$60,094
Gross margin per business	$268,365	-$30,899	$113,215	$3,973
Return on Investment	21%	-20%	24%	2%

All aspects of herd or flock operating costs are higher for businesses using BREEDPLAN or Sheep Genetics (the only exception is cost of bulls used – which is potentially impacted by the breeder assessment of the value of bulls).

The direct investments in recording and genetic evaluation are higher for businesses using BREEDPLAN or Sheep Genetics, and all aspects of herd or flock income are higher for businesses using BREEDPLAN or Sheep Genetics. Note that the costs associated with recording and genetic evaluation included a category for "other measurement costs not specified" which was substantial for businesses using BREEDPLAN or Sheep Genetics, and which includes genotyping costs. Gross margins and estimated return on investment were calculated. The estimate of return on investment did not include an owner-operator allowance, which would likely vary with the scale of the enterprise. Both gross margin per business and estimated return on investment were substantially larger for studs using BREEDPLAN or Sheep Genetics than not.

None of the gross margins per stud calculated are likely to be large enough to support a family business, with the possible exception of that for beef studs using BREEDPLAN. This implies that for any of the enterprises surveyed, any significant increase in investment would be challenging.

CONCLUSIONS

The key findings from the survey are that among the businesses surveyed:

- businesses that used BREEDPLAN or Sheep Genetics were larger, and had greater value of sales, level of operating and non-owner overhead costs, and return on investment than business that did not use the industry genetic evaluation systems.
- in both species, the distributions of these parameters were all skewed, meaning that for example the average return on investment is markedly higher than the median.
- businesses that did not use BREEDPLAN or Sheep Genetics were not only smaller, but had lower sales value, lower operating costs and overheads, and lower return on investment. In the beef studs not using BREEDPLAN, average estimated return on investment was

negative even before consideration of owner-operator allowance.
- there was wide variation in all aspects of financial performance, with coefficients of variation averaged across parameters of 176% and 154% for Sheep Genetics users and non-users respectively. There was a positive relationship between business size and gross margin per cow in beef, although there is no clear relationship between these parameters in sheep.

Three general observations about the seedstock sector can be made:
- larger herds or flocks contribute the majority of the performance data (this is not based on this survey, but on data provided by ABRI and Sheep Genetics). In beef studs using BREEDPLAN, the median herd size ranges from 25-50 depending on breed, meaning that contemporary groups of 8-10 animals must be widespread.
- users and non-users of BREEDPLAN or Sheep Genetics are distinct groups, in terms of scale, and level of investment, meaning that different communication or extension approaches and messages are likely to be needed for effective engagement with the groups.
- changing from non-adoption to adoption is financially a significant decision, particularly in beef. From this, it can be hypothesised that that "conversion" of non-adopters to adoption will only happen at a low rate, and that significant increases in the level of performance recording in studs are unlikely.

Overall, the survey data and analysis suggests that there is some capacity for increased investment in recording in studs using BREEDPLAN and Sheep Genetics. However, this conclusion is tentative, reflecting:
- the owner-operator allowance will reduce surplus funds available for investment.
- we have no way of assessing the level of uncertainty around the value of future sales – which must be a consideration for stud breeders when considering their level of investment in recording and other items of breeding business expense.
- while the BREEDPLAN and Sheep Genetics users achieve higher average and total sales value, they have to – because their investment in the business are significantly higher than for non-users.

Having a sound information base on the economics of the seedstock sector could provide a basis for assessing likely uptake of new recording and evaluation technologies. More extensive survey data would provide a stronger base for such assessments, and consideration should be given to how to achieve higher response rates than achieved in this study.

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