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Esperance beef producers 2006 survey

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Esperance Beef Producers 2006 Survey

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ESPERANCE BEEF PRODUCERS 2006 SURVEY

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OVERVIEW

Beef cattle numbers in the Esperance shire have steadily increased since the early 1980s. It is timely to investigate whether this trend will continue and to study current management practices that promote on-farm efficiency of the industry.

A survey of Esperance beef producers in 2006 showed a positive view of their industry with 60 per cent intending to increase breeder numbers. Beef cattle are mostly located in the coastal sandplain area but mallee farmers, with nearly 20 per cent of the shire herd, make a substantial contribution to the industry. Producers consider that the region's mild climate and generally reliable rainfall are favourable to the industry.

Production arrangements vary from highly diversified systems where beef cattle are integrated with sheep and cropping, to businesses which only produce beef. Production costs are generally highest along the coast as are stocking rates and gross returns per hectare.

High productivity, expressed as high stocking rates and live weight production per hectare, was correlated with high profitability. Management practices which enhance profitability include maintaining high breeder fertility, targeting stocking rates and producing high growth calves. Some other strategies with productivity advantages did not translate into extra profit. For example, focusing on pasture productivity and tactically weighing throughout the growth of weaners each had a productivity advantage. However, better implementation of these practices and improved utilisation of perennial pastures may lead to higher profits. In coastal areas on farms where cattle are the major enterprise, perennials reduced production risks.

Improved grazing management may warrant further investigation as there was no impact on productivity and profitability whether set stocking or deferred grazing were employed. In fact almost 40 per cent of farmers suggested that the carrying capacity of their pastures is below their potential. The general consensus was that further research into pasture management and utilisation, along with genetic improvements, with respect to feed conversion efficiency is needed. In addition, efficiencies are also required to maximise price advantages from well performing weaners sold to feedlots.

The concentrated calving period in the shire provides large numbers of straight line cattle for sale to feedlots. Such consistency of supply facilitates orderly arrangements throughout the supply chain to final markets. Experienced and well organised local stock agents give producers certainty in livestock trading.

The main industry weaknesses, according to survey respondents, are the perceived dominant influence of supermarket companies on prices to producers and the local industry's high reliance on the domestic market. The limited capacity of the local abattoir and its lack of export rating are seen as major limitations.

A majority of farmers mentioned that extension of practical production information suited to coastal and mallee districts should be a major goal of the local industry. Other industry improvements deemed necessary by many producers include upgrading the local abattoir to increase its cattle slaughtering capacity and to enable export certification. A more transparent and fairer auction system and consumer education for appropriate meat preparation are also seen by producers as necessary for industry development.

INTRODUCTION

A survey of Esperance beef producers was undertaken to identify productivity and profit drivers of the local industry and potential avenues for improvement.

Understanding the profit drivers of the south coast beef industry will help to identify ways to improve the industry's productivity and profitability. Integral to this is investigating the range of beef production systems employed in the area. It is also necessary to seek out research issues important to producers and their views on how best to employ the cohesive farming community to promote industry development. Accordingly the survey questions covered the following areas for the individual beef enterprises:

- Marketing
- Lifestyle
- Breeding strategies
- Production systems
- Herd management
- Industry wide issues
- Financial performance

The survey was conducted by personal interview and the data recorded using Microsoft Access™. The sample was selected from amongst farm businesses with a registered stock brand and those which have cattle according to a Department of Agriculture and Food, Western Australia (DAFWA) database. Beef cattle are raised throughout the Esperance shire but are more prevalent along the coast than in the mallee (Figure 1).

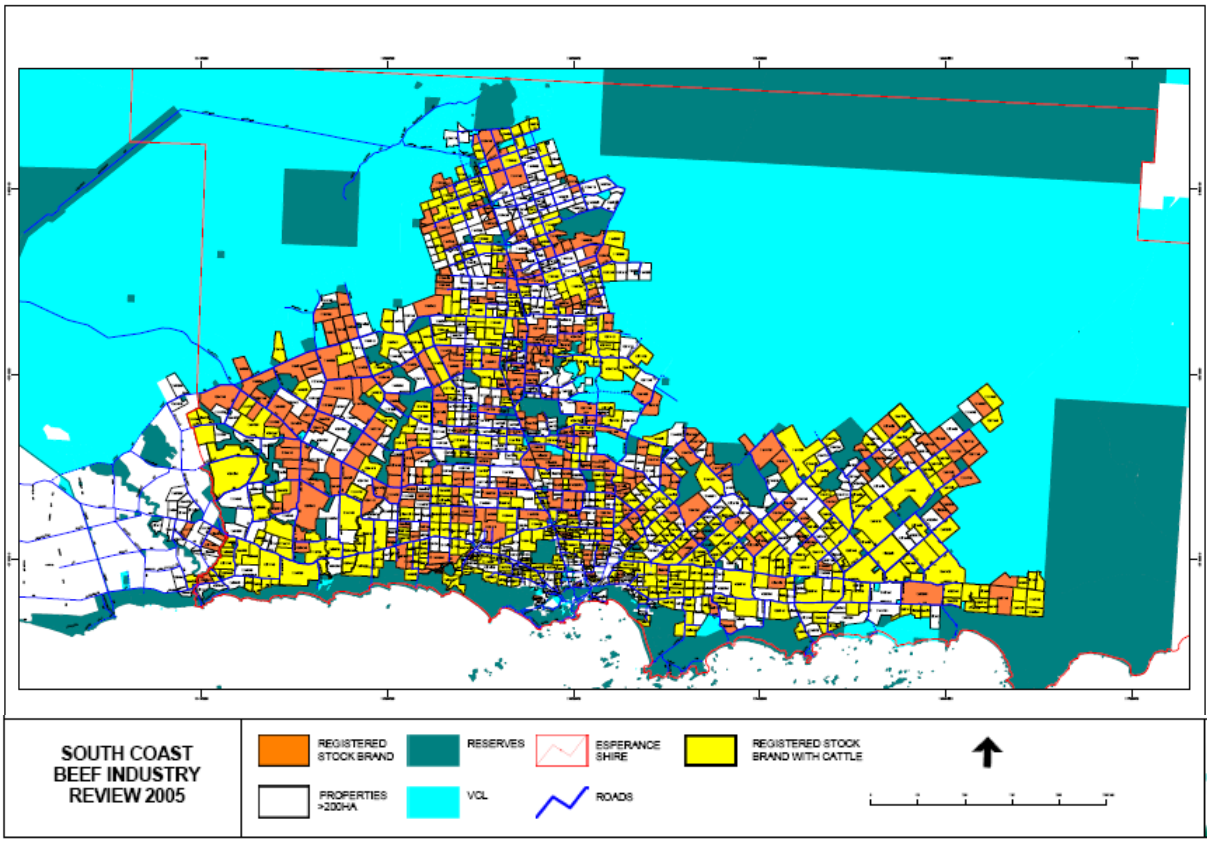

Figure 1 Map of Esperance beef producers (properties with cattle brands).
Source: Department of Agriculture and Food, Western Australia

ESPERANCE BEEF CATTLE INDUSTRY

Beef cattle have been a significant part of the shire's agricultural industry since the days of new land farming in the coastal parts of the district. However, as the share of land allocated to cropping has increased in recent decades (Figure 2), it is timely to investigate the situation of the local beef industry. The trends in Esperance beef cattle production give an indication of the strength of the industry and its likely outlook.

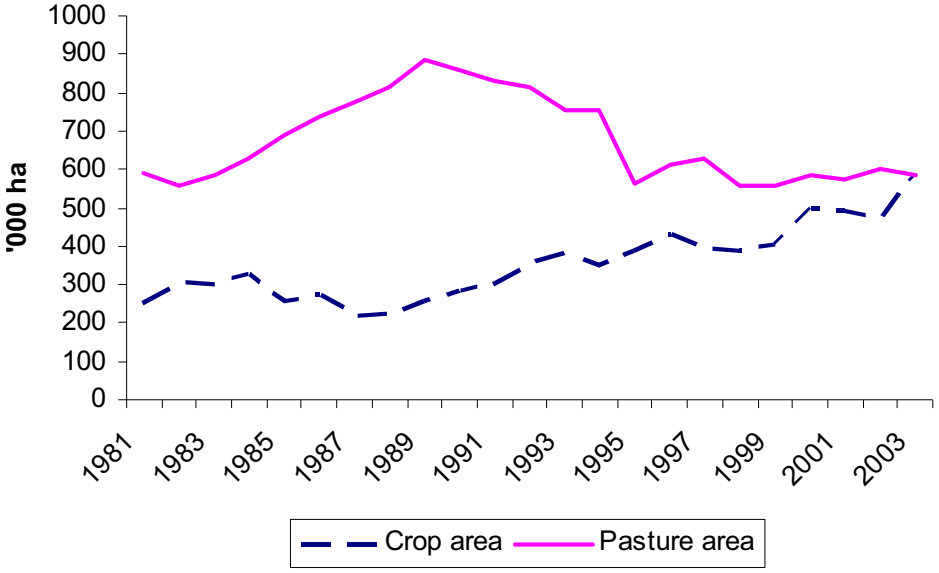

Figure 2 Esperance shire agricultural land use.

Source: ABS and DAFWA

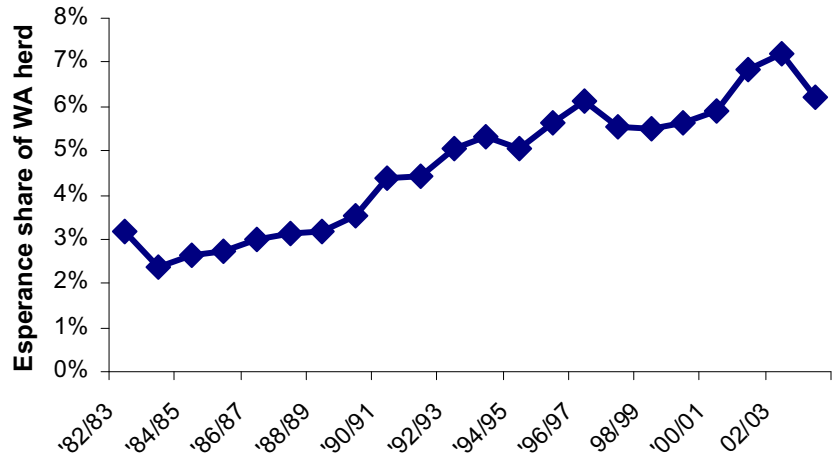

Figure 3 Share of the Western Australian beef herd in Esperance.

Source: ABS and DAFWA

Beef cattle numbers in Western Australia have increased from 1.6 million in the early 1980s to 2.0 million by 2003, and an estimated 2.2 million in 2007 (Australian Bureau of Statistics 2008). This increase has been proportionally greater in Esperance than other regions (Figure 3). Commensurate with this trend is the increase in numbers of beef cattle in the Esperance shire (Figure 4).

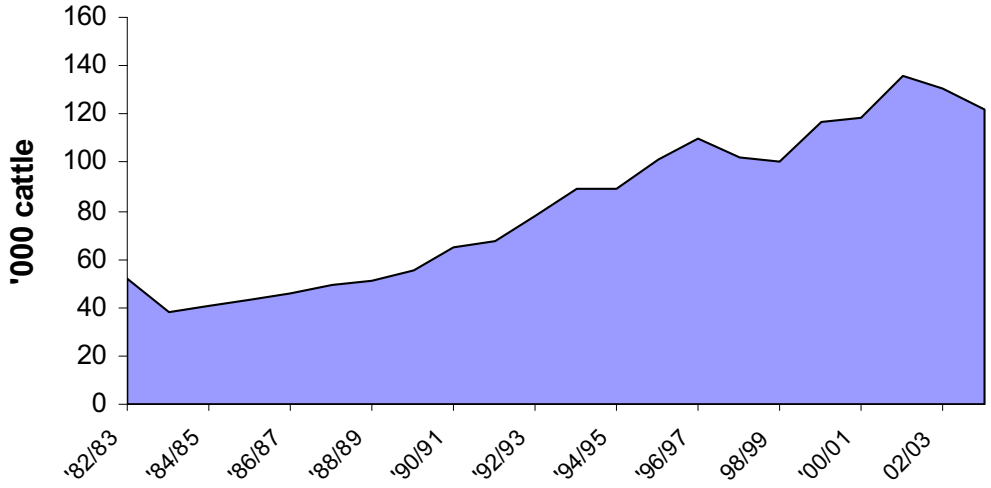

Figure 4 Esperance beef cattle numbers, 1982/83 to 2003/04.

Source: ABS and DAFWA

The beef industry has expanded even with the sustained land use change towards more cropping. The small decline in cattle numbers after 2001 resulted from the expansion in plantation forestry in coastal areas. Cattle sales in the shire were valued at about $30 million in 2003; approximately the same as the combined value of sales for sheep and lambs.

Direct comparisons between retail and producer prices cannot be made due to different indexing procedures (ABARE 2007). However, the relative growth of the two series at 3.5 per cent and 2.3 per cent indicate that average annual increases in retail prices exceeded that of producer prices. The widening gap (Figure 5) between prices producers receive for livestock and retail prices, along with the general declining farmers' terms of trade (Figure 6), makes it appropriate to examine the determinants of beef enterprise profitability.

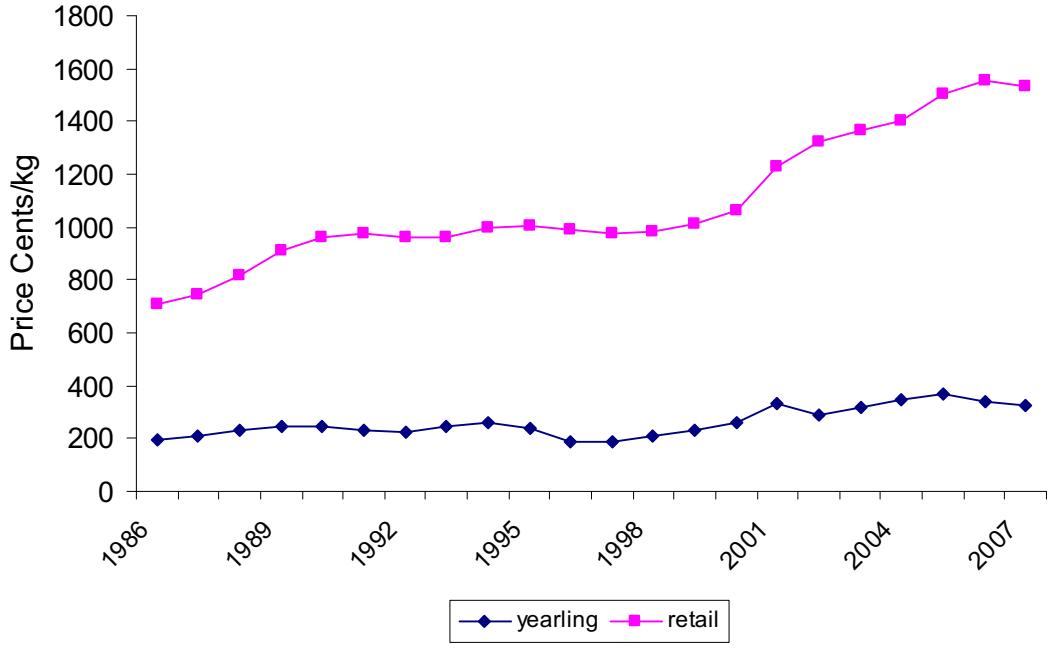

Figure 5 Trends in average saleyard and retail prices.

Source: ABARE

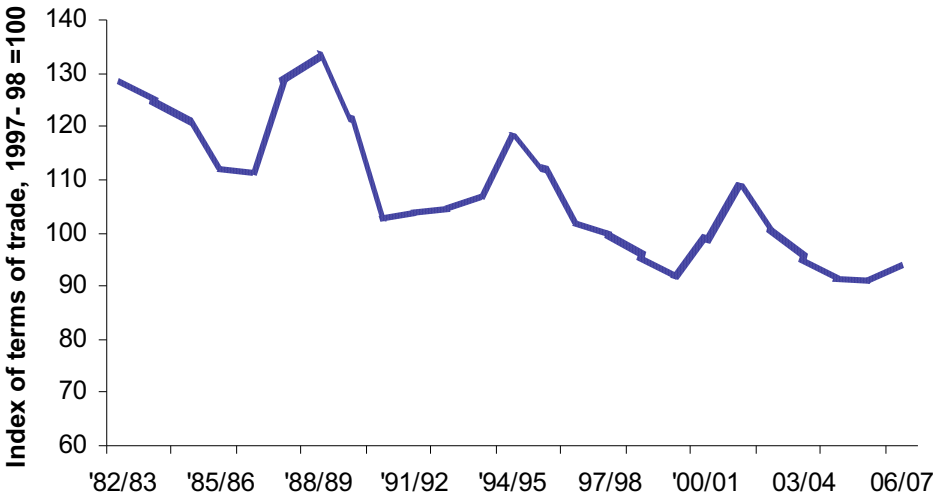

Figure 6 Farmers' terms of trade, Australia.

Source: ABARE

BEEF ENTERPRISE

Thirty-five farms were sampled from the Esperance sandplain to the northern mallee region near Salmon Gums. Since the sample farms were randomly selected along regional lines there is adequate representation of the production and associated financial parameters for Western Australia's south east beef industry.

Table 1a shows the average farm area for the entire sample and Table 1b gives the regional distribution.

Table 1a **Farm description—Esperance shire**

Characteristic	Sample average
Total farm area, ha	4236 (15)
Arable area, ha	3650 (16)
Winter pasture beef cattle area, ha	1157 (13)
Winter pasture beef cattle area as share of arable area	47% (12)
Percentage of farm receipts from beef cattle	48% (13)

(Relative standard errors, %)

Table 1b **Farm description—Esperance regions**

Characteristic	Sandplain	Southern mallee	Northern mallee
Total farm area, ha	3811 (21)	3487 (28)	6613 (18)
Arable area, ha	3423 (24)	3185 (30)	4987 (22)
Winter pasture beef cattle area, ha	1275 (16)	700 (36)	1161 (33)
Winter pasture beef cattle area as share of arable area	58% (12)	30% (42)	24% (18)
Percentage of farm receipts from beef cattle	57% (13)	30% (47)	18% (25)
Number of farms sampled	23	6	6
Share of population sampled	19%	20%	22%

(Relative standard errors, %)

The average area per surveyed business is largest in the northern mallee. However, the greatest area allocated to cattle is on sandplain farms where the percentage of arable land used by cattle averages 60 per cent. In addition, beef enterprises on commercial cattle properties in the sandplain account for around 60 per cent of their gross value of farm production. This value decreases to 30 per cent in the southern mallee from Gibson to Grass Patch and to less than 20 per cent for farms north of Grass Patch. For each region, the share of farm business receipts from beef is equal to the relative share of land allocated to cattle. This suggests that beef cattle are one of the most productive uses for agricultural land in the Esperance shire.

Table 2 **Cattle numbers**

Characteristic	Sandplain	Southern mallee	Northern mallee
Breeder numbers*	567	142	111
Breeder numbers in sample range	50–1700	25–850	80–500
Breeder numbers, average	605 (16)	305 (40)	227 (30)
Weaning percentage	91 (1.5)	82 (7)	89 (3)
Weaning percentage in sample range	74–104	56–90	80–96
Stocking rate DSEs/winter grazed ha	8.3 (4)	6.1 (13)	3.6 (14)
Stocking rate in sample range, DSEs per winter grazed ha	5.0–12.0	4.5–9.5	1.9–5.5

(Relative standard errors, %)

* Median adjusted to exclude outliers.

Note: 1 DSE is a dry sheep equivalent according to a standard 50 kg wether.

Looking at breeder numbers along with dry sheep equivalents (DSE) per farm (Table 2) and relative numbers of farms sampled (Table 1b) shows the industry is highly concentrated on the sandplain. Here the range in cattle numbers varies, with 605 being the average number of breeders. The industry also has a significant presence in mallee areas with beef producers typically having more than 100 breeders.

In each of the three regions there is wide variation in stocking rates and weaning percentages. As expected from rainfall patterns (Figures 7a, 7b), the stocking rate is much greater along the sandplain than in the mallee (Table 2). In the mallee, stocking intensity is much lower north of Grass Patch than in the southern mallee. The lowest intensity in the southern mallee is similar to the highest stocking rate for northern areas. However, the average weaning percentages are comparable between all districts.

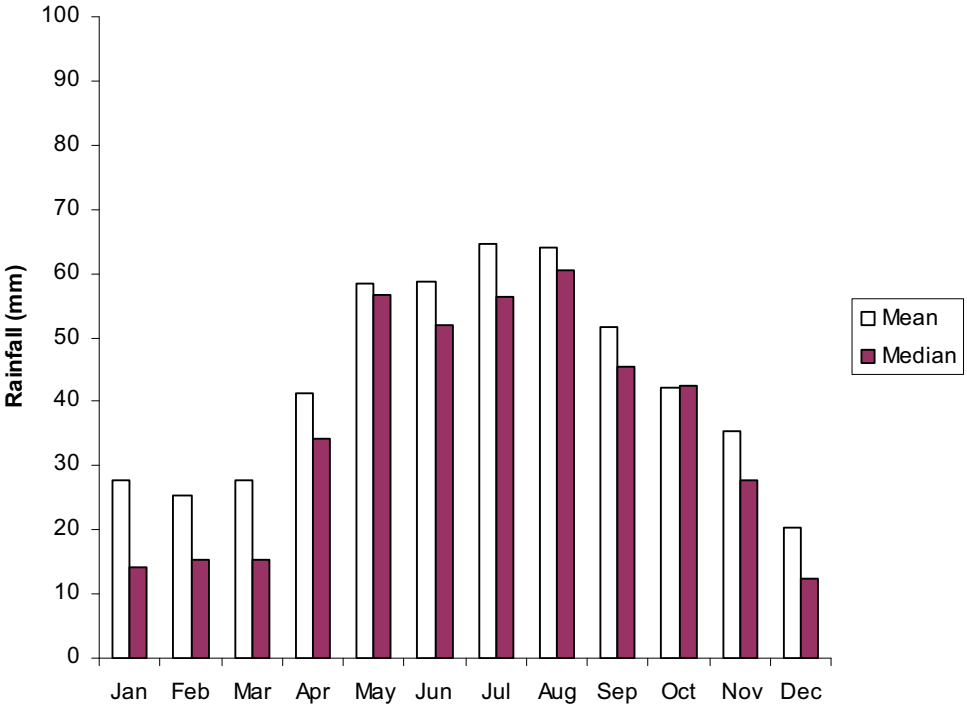

Figure 7a Average annual rainfall—Esperance Downs Research Station.

Source: 1968–2008 series, Department of Agriculture and Food, WA and Australian Bureau of Meteorology

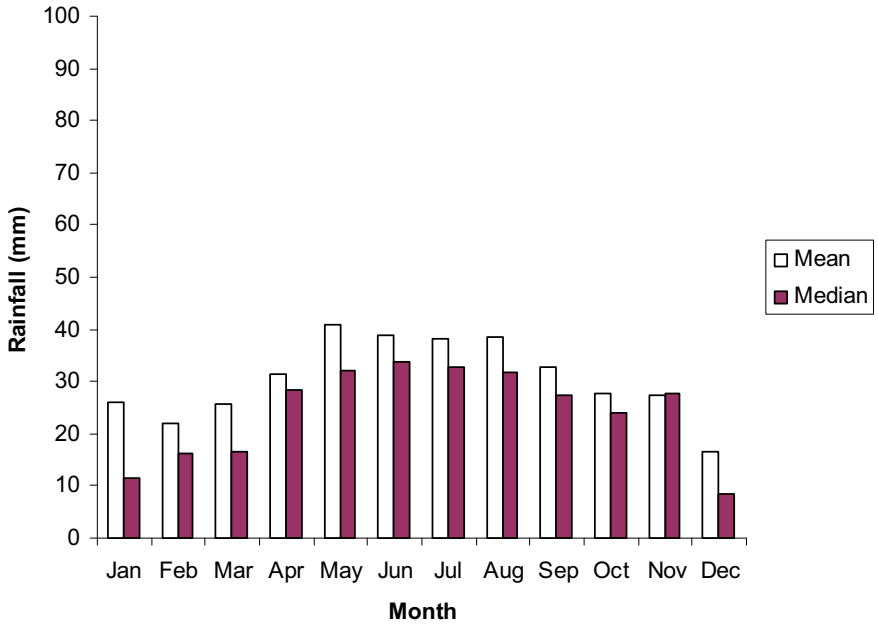

Figure 7b Average annual rainfall—Grass Patch.

Source: 1968–2008 series, Department of Agriculture and Food, WA and Australian Bureau of Meteorology

Table 3 **Financial summary**

Characteristic	Sandplain	Southern mallee	Northern mallee
Land productivity, kg beef live weight per ha	177 (6)	133 (8)	72 (20)
Total costs, $/ha	203 (7)	132 (16)	66 (23)
Gross receipts, $/ha	262 (6)	173 (14)	87 (18)
Costs of production per kg beef live weight	1.22 (8)	1.01 (13)	0.94 (12)
Receipts net per kg beef live weight sold	1.49 (2)	1.36 (4)	1.37 (3)
Trading income*, $/ha	276 (5)	204 (13)	101 (18)
Gross margin, $/ha	158 (7)	102 (7)	53 (19)
Profit, $/ha	92 (16)	83 (31)	37 (26)
Rate of return on assets, %	3.4 (17)	3.6 (32)	3.8 (24)

(Relative standard errors, %)

Productivity in terms of beef production per hectare is highest on the sandplain and lowest in the northern mallee. Total receipts, trading income and gross margin, all expressed on a per hectare basis, follow this same distribution (Table 3). To achieve these productivity advantages, production costs per hectare and per kilogram produced are significantly higher for the sandplain than the mallee businesses, with the lowest in the northern region. Farm gate receipts per kilogram live weight sold are also greater for sandplain than mallee producers. This is due to lower transport costs for coastal properties as gross receipts per kilogram are similar across all regions.

Profit accounts for overheads, livestock purchases, change to annual value of the livestock inventory as well as operating (variable) costs required in beef production. By this measure there is no difference in profitability between the sandplain and southern mallee beef enterprises while the northern mallee has a markedly lower dollar profit per hectare. However, the returns on investment are similar in all regions indicating that on average the industry is using resources equally efficiently across the shire.

There is a high negative correlation (-0.40, significant at 2 per cent level) between total breeder numbers and use of manager labour on a per hectare basis. This indicates economies of scale in terms of reduced manager labour employed per hectare with large herds. A similar rationing of labour exists in relation to the area allocated to cattle grazing again suggesting that as the size of the cattle enterprise increases manager labour input is more thinly spread. In addition, the high correlation of 0.43 between breeder numbers and stocking rate suggests that as the size of an operation increases producers seek production efficiencies.

Profitability in terms of rate of return at full equity increases (correlation of 0.40) with the size of operation. Amongst sandplain farms, economies of scale operate over cattle inputs in general since total costs per hectare become lower and the rate of return on investment rises as the number of breeders increase.

Lifestyle

Producers had an overall positive view of farming and regarded their beef enterprise as both an appropriate use of resources and making a strong contribution to their business. Both coastal and mallee producers considered beef as relatively climate neutral. They regarded the beef enterprise as capable of handling the vagaries of climate experienced in the region, and less sensitive than either cropping or sheep. Some farmers observed that cattle seemed to utilise pastures and dams more effectively than sheep and resulted in less soil erosion and compaction. However, others suggested that cattle are harder on fences and water troughs and bulls are prone to digging holes.

In recent years, beef cattle have been seen to be less risky than other enterprises as grain prices have fluctuated while production costs increased and wool returns have been relatively low. The low labour intensity and husbandry requirements of the grazing beef operation also contribute to a relatively low cost structure. Generally, little off-farm labour is required in this enterprise and capital requirements such as machinery and buildings are lower than for many other enterprises. These factors have helped to keep the industry sustainable since beef cattle prices have been fairly constant over recent years. However, anecdotal evidence suggests that during 2008 prices contracted compared to the recent past.

Cattle production has a flexible time schedule apart from some intensive periods during calving and preparing animals for sale. Cattle are generally regarded by producers who also have sheep as being much easier to manage, requiring less handling and are more robust than sheep. This helps to ease the work load on operators thus reducing the pressure on families and enhancing the farming lifestyle. Although in some cases it just allows more time for other farm work; the demands of which have increased in recent years with labour shortages in the rural work force.

The relatively low cost of production and stable prices have made beef an attractive diversification and risk management option on mixed cropping and livestock farms. In mixed farming businesses, cattle fit comfortably both in terms of land use and timing of farming operations. Most producers surveyed have been in the industry for many years attaining substantial expertise and plan to remain in this business. However, around 15 per cent may retire within the next five years, but will keep operations within the family. Another 15 per cent have recently taken over the family business from their parents.

All farmers keep appropriate business records sufficient for annual budgeting and taxation requirements. About one-fifth of farms surveyed have a formal business plan which is reviewed regularly. However there is little difference in beef enterprise profits between those with and without written plans. It appears that having a formal plan reflects management style rather than being a critical component for a profitable enterprise. However, this cannot be extrapolated to total farm profit as that financial measure was not part of the survey.

MARKETING

Weaner sales are a key market for beef producers across the Esperance region with virtually all those in the mallee selling weaners.

The large majority of sandplain producers sell weaners, with about half of the group keeping some young animals beyond 12 months of age (1–2 years). A few farmers keep all their weaners and either grass feed or feedlot them before slaughter. Of those who market yearlings, the average proportion of weaners held over is about 50 per cent. However, the volume of weaner sales on the coast is on average more than twice that for yearlings (Table 4a, 4b). On average nearly 70 per cent of young cattle sales from the sandplain are weaners and 30 per cent are over 12 months of age (Table 4b).

Amongst southern mallee producers, 83 per cent sold weaners and one-third traded in yearlings (Table 4a) but in relatively small numbers. Yearling sales are a larger contributor in the northern than southern mallee (Table 4a). However, in the mallee generally over 90 per cent of sales of young cattle are weaners (Table 4b).

Table 4a **Average number of animals sold****

Category of livestock	Sandplain	Southern mallee	Northern mallee
Weaners	263 (83)	200 (83)	119 (100)
Yearlings (1–2 years)	251 (57)	26 (33)	42 (33)

** Includes only those that sell animals in the particular category. ( ) is proportion of producers in a region selling the particular category of livestock.

Table 4b **Average regional percentage of animals sold in each category**

Category of livestock	Sandplain	Southern mallee	Northern mallee
Weaners	71	97	91
Yearlings (1–2 years)	29	3	9

Four of the five producers in Esperance who purchase store cattle for growing out are located in the sandplain. Most of these sell the yearlings to abattoirs with two producers operating large-scale intensive feedlots.

Backgrounding weaners in preparation for selling to livestock finishers is practised by one in three producers in the sandplain and southern mallee. This does not occur in the northern mallee probably due to the relative lack of pasture feed and hay yields being low compared to cropping. Producers in that area who grow hay do so primarily for maintenance feed during summer/autumn.

In addition to selecting the age of cattle sold, other aspects of active marketing such as adopting specific technology and price monitoring were examined. Apart from a couple of operators in the mallee, all producers monitor prices at least around the time of selling. In the coastal region, one-third of producers regularly survey prices throughout the year. There is a wide range of uses for price monitoring, the most common being price negotiation, timing of sales and market targeting. About 30 per cent of businesses employ particular technology such as animal measurement and handling equipment to enhance their marketing opportunities. This was much more common along the coastal sandplain than in other areas of the shire.

Timing of sales

By far the most common time of selling is November to March when weaners are marketed (Figure 8). There is little difference in the average sale price (per kilogram) for farms offering their cattle only during that period, in combination with other times during the year or only outside the summer period (Table 5).

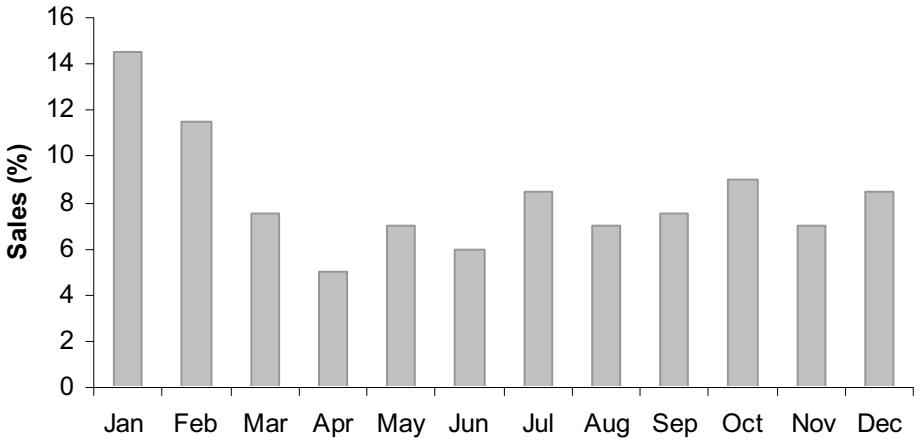

Figure 8 Cattle sales distribution of Esperance beef producers.

Source: DAFWA Esperance Beef Survey

Table 5 **Average price with timing of sales ($ per kg live weight across all sales)**

	Nov.–Mar.	Dec.–Feb.	Jun.–Aug., Jan.–Mar.	May–Aug.	Jun.–Dec., Jan.–Feb.	Sep.–Nov.
Price	1.47	1.49	1.46	1.43	1.31	1.43
Number of businesses	9	7	8	5	4	2

Producers are generally satisfied with their current marketing schedule with very few considering any changes. The absence of any incentive to change is supported by the lack of correlation between profit per hectare and average price per kilogram of beef sold.

Marketing success

Market success was measured by the broad indicator percentage of sales that achieve the goals set by each producer. Since individual producers have different pricing targets according to class of livestock which vary from time to time, recording the actual quality standards reached by sales was beyond the scope of this study. Details of the wide range of possible market requirements and deductions/bonuses were not specifically examined. In addition, producers often sell to feedlots where they have established relationships, thus making weight and age comparisons across different enterprises inappropriate. Therefore, the criteria of weaner quality, live weight and carcass yield and fit within the expected grid for abattoir sales are consolidated into a single percentage success rate for each respondent.

Generally the percentage of sales reaching the desired marketing standards was high (average 86 per cent). However, there is still considerable variability between farms with a high correlation between that degree of success and profitability. This most likely reflects better overall management by those who reach their market objectives as prices achieved and live weight productivity were independent of market success. The degree of marketing success and production costs were also largely independent of each other.

Coastal businesses on average met nearly 90 per cent of their targeted marketing standards. Almost half of those producers submit some of their sales for MSA grade. On average, producers in the two mallee areas achieve almost 85 per cent of their marketing objectives. Around one-third of producers in the southern mallee access the MSA market while those north of Grass Patch do not.

Three-quarters of surveyed producers use specific strategies to obtain marketing advantages. For example, 60 per cent of farmers target weaner or yearling weights and one in five producers finish animals according to premium carcass quality traits.

One-third of the sample place a high priority on carcass quality and achieve a gross margin advantage through significantly better cattle receipts and livestock trading balance (Table 6). This is achieved by a small price ($/kg LW) advantage but mainly through turning off a greater percentage of the beef produced (clearance ratio). That combined with no difference between these two groups in overall annual change of live weight (LW) held on-farm (per hectare, kg LW/ha) suggests that farmers with a higher priority on carcass quality better manage sales intertwined with production. This is also associated with high operating costs but still results in a better gross margin. However, Table 6 shows these businesses have greater overheads resulting in similar profits to those that do not place extra emphasis on carcass quality.

Table 6 **Targeting carcass quality**

	Targeting	Not targeting	t-test ratio probability %*
Productivity, kg LW/ha	161	145	47
Live weight sold, kg LW/ha	169	104	1.7
Price received, $/kg LW	1.48	1.42	26
Gross receipts, $/ha	273	184	2.5
Trading income, $/ha	267	214	12
Variable costs, $/ha	116	68	2.5
Overheads, $/ha	95	72	17
GM, $/ha	156	115	8.5
Profit, $/ha	77	83	75

* Based on the null hypothesis of no difference in sample means.

There are significant price and live weight productivity advantages where producers aim to sell weaners that gain weight efficiently in feedlots. The greater productivity was through higher stocking rates rather than from greater production per breeder. With these high stocking rates the cost of production per kilogram live weight and per hectare is substantially higher on those properties than where feedlot performance is not of greater than normal concern. The overall effect is a slightly positive result for gross margin but there is no advantage for profitability. Thus cost efficiencies for operating inputs and overheads need to be addressed for the focus on feedlot performance to result in enhanced profits (Table 7). This is underlined by variable costs on a per hectare basis for enterprises highly intent on meeting feedlot requirements being on average twice those not claiming to be so highly focused. The extra revenue per kilogram for beef sold by those giving a high consideration to feedlot requirements is not significantly more than the extra costs incurred. Therefore, it can be concluded that these producers do not achieve the anticipated benefits from their extra effort.

Table 7 **Targeting feedlot performance**

	Targeting	Not targeting	t-test ratio probability %*
Productivity, kg LW/ha	173	139	11%
Price received, $/kg LW	1.51	1.41	6%
Cost of production, $/kg LW	1.01	0.80	9%
Gross receipts, $/ha	271	185	2%
Trading income, $/ha	278	207	3%
Variable costs, $/ha	120	66	1%
Overheads, $/ha	94	73	20%
GM, $/ha	151	118	15%
Profit, $/ha	86	78	>50%

* Based on the null hypothesis of no difference in sample means.

Quality assurance programs

Quality assurance (QA) programs may be part of a producer's marketing strategy as well as production system. For example, maintaining complete up-to-date records on treatments administered to cattle fulfils both QA requirements and assists in timely provision of livestock husbandry. However, farmers generally felt that they were not paid a suitable premium for implementing QA systems that meet more than the minimum requirements necessary to sell livestock. This is reflected in the analysis over the entire sample where there is no significant difference in prices received or profits between those producers who employ QA programs and those who do not (Table 8a). Accordingly 43 per cent of surveyed producers do not implement a QA program on their farm. Where quality monitoring systems are implemented they ranged from the highly detailed SQF1000 to Livestock Production Assurance (LPA) that is mandatory once individual producers complete their first book of the new National Vendor Declaration (NVD) forms.

Table 8a **Certified quality assurance (QA)**

	kg LW/ha		Profit $/ha		Price $/kg LW	
	QA	No QA	QA	No QA	QA	No QA
	152	151	87	72	1.43	1.47
t-test ratio probability*	> 50%		> 50%		32%	

* Based on the null hypothesis of no difference in sample means.

On the sandplain, although there was no price advantage for QA producers, profits were slightly higher than for those who did not implement QA. This is likely a reflection of the management capability of producers who employ such programs rather than the programs themselves. Supporting that inference is the certified quality-assured sandplain producers obtain an advantage in their beef cattle trading account (Table 8b). However, amongst mallee producers there was no difference in either profit or net trading cattle income between QA and non-QA producers.

Table 8b **Sandplain producers and certified quality assurance (QA)**

	kg LW/ha		Profit $/ha		Price $/kg LW		Trading account profit $/ha	
	QA	No QA	QA	No QA	QA	No QA	QA	No QA
	180	173	110	67	1.48	1.49	294	253
t-test ratio probability*	> 50%		14%		> 50%		14%	

* Based on the null hypothesis of no difference in sample means for Sandplain farms.

National Livestock Identification System

The National Livestock Identification System (NLIS) is now a fundamental part of both marketing and the national cattle health system. Generally farmers do not have problems with its implementation but some are yet to see any significant immediate benefits. However, a few of the large scale producers have their own tag readers and make a link with recording cattle weights and thus incorporate the NLIS in their management. It is equally common for the tags to be attached at marking or just prior to selling. Being a mandatory requirement for livestock not sent directly from property of birth to an abattoir, around one-third of producers consider the NLIS an unrecoverable cost.

BREEDING PROGRAMS

A wide range of breeds are used in the region. On the sandplain, the most common are Angus and Murray Grey. However, in the mallee there is no dominant breed with Angus, Murray Grey and South Devon bulls commonly used over a wide range of breeders. The Figures 9 and 10 show the distribution of bull and cow breeds across the entire sample.

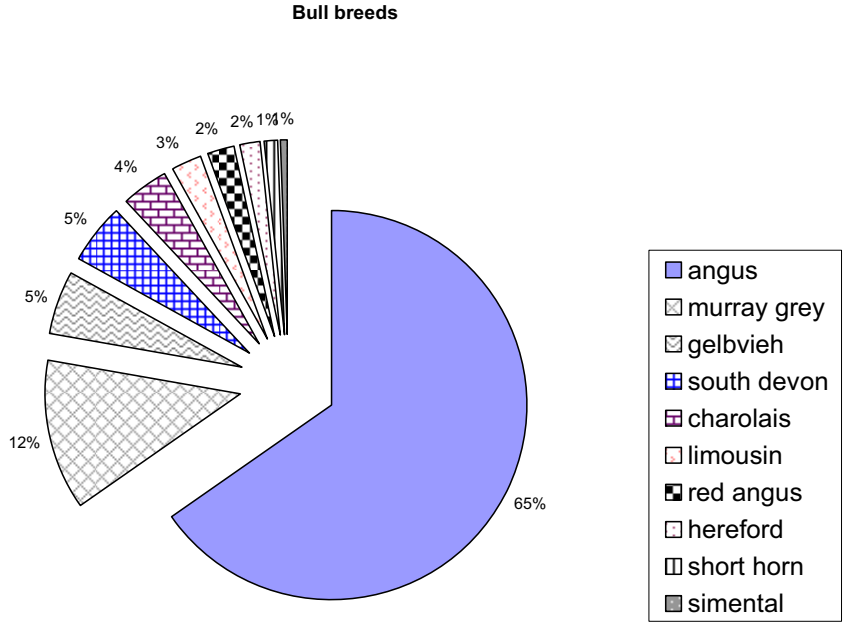

Figure 9 Bull breeds.

Source: DAFWA Esperance Beef Survey

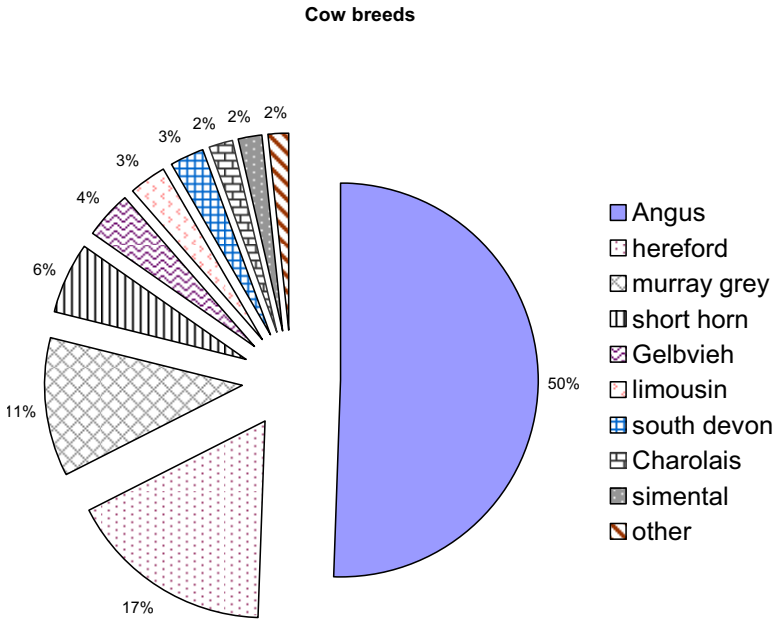

Figure 10 Cow breeds.

Source: DAFWA Esperance Beef Survey

Generally producers intend to keep their current bull breeds in the medium term. Two-thirds of farms on the sandplain have Angus bulls while almost one-third have Murray Grey. The other main breed along the coast is Charolais on 20 per cent of properties, which are often in conjunction with Murray Grey. In most cases where Angus bulls are used the breeders also have Angus genetics. However, the most common non-Angus breed crossed with Angus bulls is Hereford.

On average, profitability on the sandplain is somewhat higher for Angus than non-Angus based genetics, possibly due to greater productivity on the Angus holdings with their relatively higher stocking rate (Tables 9a, 9b). There is very little difference between average prices received and total beef production costs for Angus and non-Angus based herds (Table 9b).

Table 9a **Productivity with Angus and non-Angus bulls on the Sandplain**

	kg LW/ha		Stocking rate, DSEs per winter grazed ha	
	Angus	non-Angus	Angus	non-Angus
	191	149	8.6	7.4
t-test ratio probability*	10%		10%	

* Based on the null hypothesis of no difference in sample means for Sandplain farms.

Table 9b **Financial performance with Angus and non-Angus bulls on the Sandplain**

	Price $/kg LW		Costs $/ha		Profit $/ha	
	Angus	non-Angus	Angus	non-Angus	Angus	non-Angus
	1.46	1.53	199	216	110	60
t-test ratio probability*	30%		60%		8%	

* Based on the null hypothesis of no difference in sample means for Sandplain farms.

Half of the farms in the southern mallee use Angus bulls and half use Murray Grey genetics. Angus bulls are put across Angus cross cows while the Murray Grey bulls are used with Short horns and Poll Herefords. In the northern mallee, Murray Grey and South Devon are the most commonly used bull genetics, which are crossed with a wide range of breeders including South Devon, Angus, Hereford and Santa Gertrudis.

In each of the three districts about 30 per cent of producers operate their own stud to generate bulls. There was no statistical difference in profitability for those businesses with their own stud compared to those which bought in bulls.

Breeding selection criteria

All producers conducted a breeding program with varying degrees of stringency in applying selection criteria. Of the 35 producers surveyed, 31 claimed to have an objective breeding program. Along the coast, where a greater share of farm income comes from beef production, the breeding selection criteria are more intensive than in the mallee. Only three producers use 'breedplan' while another 15 use Estimated Breeding Values (EBVs). The remaining producers employ visual appraisal and culling to undertake their continuous improvement program. However, there was no significant difference in productivity and profitability between businesses using or not using EBVs. This may be due to the limited number of characteristics and stringency to which the EBVs were applied and therefore the somewhat incomplete implementation of objective breeding.

About half of the sandplain and northern mallee producers maintain comprehensive breeding records which identify bulls and breeders for each calf. Of those sandplain producers, the cattle enterprise is about 75 per cent of their total business, while those who do not keep detailed breeding records earn less than half the gross value of farm production from cattle.

There is little difference in the number of criteria used in the breeding programs across the three districts. On average, seven criteria are used by sandplain producers and six by those in the mallee. Suitable conformation is sought by the great majority of producers. Mild temperament, growth rate and structural soundness are the next most common criteria and used by half of the producers to select bulls and breeders. Table 10 shows the most common characteristics used in selection.

Table 10 **Selection criteria chosen for breeders and bulls**

Characteristic	Number of producers
Suitable conformation	30
Mild temperament	18
Growth rate	17
Structural soundness	17
Good feet	14
Moderate cow size	13
Birth weight	12
Cow fertility	10
Good frame	8
Body shape	7
Level tail bone	7
Soft lines	7
Good muscling	7
Milk production	7

In view of the wide range of criteria (47 over the entire sample) for selecting breeding animals it is worthwhile to examine implications for profitability. Since individual producers combine a number of selection criteria, the overall result is a mingled confluence of each. However, since any particular characteristic is almost in random combination with the others then valid conclusions can be drawn from the statistical correlations. Breeding indexes for the respective herds were not available and therefore the relativities are only of an approximate qualitative nature. In addition, since breeding criteria is only one of the many determinants of profitability, comparisons also reflect underlying production factors.

Because of the small sample size in mallee areas, only coastal sandplain farms are examined for relative returns associated with breeding selection criteria. Selecting by higher fertility was apparently conducive to better profitability with greater beef production per hectare (Table 11). High milk production was associated with high profitability reflecting cost efficiencies. High milk productivity may be associated with feed conversion efficiency that requires fewer inputs for given stocking rates. However, further research is needed to investigate the underlying causes behind these reduced costs of production.

Table 11 **Financial impact with some breeder and bull selection criteria***

	Fertility			High milk production		
	Yes	**No**	**t* %**	**Yes**	**No**	**t* %**
Productivity, kg LW/ha	205	169	13	177	177	99
Trading, $/ha	310	266	22	258	283	53
Total costs, $/ha	186	212	28	142	229	0.3
Profit, $/ha	147	76	13	128	78	22

* Based on the null hypothesis of no difference in sample means for Sandplain farms.

Selecting according to growth rate, birth weight, structural soundness and muscling did not impact profitability. Animal temperament or frame did not impact on the financial performance or productivity of herds. This lack of apparent influence may not be a reflection of an absence of their individual importance but there may be a dilution effect of other influential criteria. In other cases, for example birth weight, the criteria may not be relevant in one production system but important in another farm so that the productivities on each enterprise are the same. In addition, some respondents may consider particular criteria but did not indicate during the interview their significance in their breeding program. Further and more detailed questioning is needed for an analysis to cover these issues.

PRODUCTION SYSTEMS

There are many components to farming production systems, so just the main aspects are outlined below. These are in turn related to financial and production data to elicit some of the profit drivers of the region's cattle industry.

Enterprise linkages

Just over 60 per cent of the surveyed properties have grazing and cropping enterprises. Crop stubbles from most of these farms are utilised to some degree by cattle. On a substantial proportion of the mixed enterprise farms there are areas of permanent pasture. However, 80 per cent of those businesses rotate pastures with cropping.

Nearly 60 per cent of the businesses have both sheep and cattle with the majority rotating them over the same paddocks to obtain benefits for worm control and better pasture utilisation. On a substantial proportion of farms, sheep frequently graze alongside cattle in the same paddock. Of the producers with no cropping enterprise, 60 per cent do not have sheep.

Almost a quarter of farms source bulls from their own stud involving a separate nucleus breeder herd and about one in ten producers operate a feedlot using some of their own grain.

Hay and perennial pasture

Hay for feeding cattle is produced on most farms, so it is worth examining the efficiency with which it makes a contribution to the beef enterprise profitability. Since hay is produced mainly for cattle, the intensity of its use is expressed as the area of hay production relative to winter grazed hectares by cattle. Hay purchases are minimal and hay production is set up only for the normal annual amount of feeding out. Thus the greater the area of hay relative to winter grazed area, the greater the intensity of hay utilisation in terms of land resource allocation. Hay usage can also be expressed in terms of the hay area per DSE (dry sheep equivalent) which indicates the extent of resources allocated to supplementary feeding. Also, since perennials are used on most coastal beef properties, the allocation of land to those pastures relative to hay production may show some economies of substitution.

Table 12 shows that the cost of beef production tends to be higher when more hay is used. Overall unit costs increase as the area of hay cut expands relative to the grazing area and with increasing use of operational and fixed inputs in production and feeding of hay. However, profit per hectare is not reduced due to the balancing rise in stocking rate (and subsequently production) the more intense is the allocation of land to hay. However, there is a significant decrease in profit per DSE as cost increases coincide with rising intensity of supplementary feeding. Thus, there is a highly negative correlation between resources given to hay production on an individual animal basis and profit per hectare. Hence it is necessary to monitor hay usage as it reflects on-farm resource allocation and to match efficient pasture use (as indicated by stocking rate) in combination with supplementary feeding. This is particularly important in low rainfall seasons with relatively poor pasture growth.

Table 12 **Correlation between hay intensity and performance indicators over the entire sample**

Correlation	kg LW/ha	Total costs	Profit
Hay area as share of winter grazed area	0.22 (20%)	0.42 (1%)	-0.12 (49%)
Hay area per winter DSE	-0.02 (92%)	0.43 (1%)	-0.42 (1%)

* Figures in ( ) t-test ratio probability based on the null hypothesis of no correlation.

In order to further understand interactions between hay and perennial pasture use, the sample was separated into two groups—primarily cattle producers and mixed farming businesses. The partial correlations are less likely to be affected by factors outside the cattle enterprise for businesses with a higher percentage of their total enterprise allocated to beef production. Of the specialist beef producers, an average of 87 per cent of their land was allocated to cattle. For the mixed enterprise businesses, an average of 22 per cent of their arable farm area was grazed by cattle.

It might be expected that increased use of perennials is associated with reduced hay production. On the coastal sandplain this is true for farms with more than 65 per cent of their total area with cattle (Table 13). This suggests that perennials to some extent can reduce the need for supplementary feeding. On average, 36 per cent of arable land grazed by cattle on these farms is sown to perennial pastures.

Table 13 **Correlations between hay and perennials intensity****

	Cattle specialist farms	Cattle less than 50% farm area
Correlation coefficient	-0.60	0.51
t-test ratio probability*	4%	1%

* Based on the null hypothesis of no correlation.

** Area of hay or perennials as share of cattle winter grazed area.

On cattle specialist farms, perennials cover a large portion of grazing area and there appears to be some degree of substitution between hay and perennial grazing. As the extent of perennial grazing increases, the importance of hay declines and the productivity in terms of beef production per hectare improves (Table 14). The positive correlation between perennial use and productivity indicates these pastures are conducive to enhancing live weight productivity per hectare. This is through animal productivity rather than from enhanced stocking rate. Also, increasing the proportion of area sown to perennials was associated with reduced pasture costs. This is a consequence of lower fertiliser and other pasture treatment costs in perennial pastures compared with annual pastures.

Table 14 **Correlation between perennial intensity** and performance indicators for cattle specialist farms**

	DSEs/ha	kg LW/ha	Operating costs $/ha	Pasture costs $/ha	Profit $/ha
Correlation coefficient	-0.08	0.44	-0.56	-0.42	0.23
t-test ratio probability*	81%	16%	6%	9%	47%

* Based on the null hypothesis of no correlation.

** Area of perennial as share of cattle winter grazed area.

However, improved productivity did not correspond to better profitability (Table 14). The reductions in variable costs were not accompanied by a corresponding trend in either overhead costs or trading income (receipts minus purchases plus annual change in value of livestock on hand). This is partly a result of fixed costs such as rates, insurance, depreciation and permanent labour being unrelated to the type of pastures grazed. Even though there is a direct relationship between per hectare live weight beef production and increases to perennial intensity, stocking rates and hence trading income were independent of perennial use. However, since cattle thrive on perennial pastures in terms of their live weight gain there is potential to improve grazing management that will lead to enhanced stocking rates and better financial returns. Further research into this aspect of cattle production systems is worth investigating along with the environmental benefits associated with perennial use (Jones *et al.* 2007).

As perennial usage increases, specialist producers lower the overall enterprise risk through reducing operating costs and their own labour input for hay production, supplementary feeding and pasture management. Even though manager labour hours reduce as perennial intensity increases, the imputed dollar rate per hour worked may actually increase since the required level needs to cover the opportunity costs of a manager's salary. However, to fully investigate this aspect, actual hours worked in the cattle enterprise need to be recorded along with time spent on other activities.

For specialist cattle producers in the coastal area, the negative correlation between the share of the properties' land for hay to productivity and profitability suggests that an increasing requirement for livestock hay occurs in situations of lower productivity (Table 15). This is confirmed since the allocation of manager labour also increases with the intensity of hay production and as the reliance on hay increases the kilograms of beef production per hectare decreases. That lower productivity is a reflection of individual animal production as the stocking rate is independent of hay production. The reduced profitability associated with increasing resources in hay production is due to a combination of lower productivity and higher operating costs.

Table 15 **Correlation between hay intensity** and performance indicators for cattle specialist farms**

	kg LW/ha	Operating costs $/ha	Pasture costs $/ha	Manager labour $/ha	Profit $/ha
Correlation coefficient	-0.60	0.68	0.41	0.63	-0.46
t-test ratio probability*	4%	2%	19%	3%	14%

* Based on the null hypothesis of no correlation.

** Area of hay as share of cattle winter grazed area.

On farms where cattle occupy less than half of the arable area there is a positive correlation between the uses of hay and perennials (Table 13). For these farms, perennials are not used as a substitute for hay as is the case for cattle specialists, but instead are complementary and used to augment hay to improve productivity by enhancing stocking rate. These businesses with numerous enterprises have many choices in allocating resources to gain efficiencies. Therefore, with winter/spring land availability limiting both hay and perennials for summer feed, they are used together to gain the greatest overall efficiency. These two feed sources together enhance livestock carrying capacity beyond the limits imposed by crop stubbles and annual pastures.

The necessity for flexibility in land use where cattle are not the predominant enterprise results in on average about 20 per cent of their cattle pastures in perennials, a much smaller area than on the cattle specialist farms. There is a significant direct correlation between productivity and both hay and perennials areas relative to cattle grazing area (Table 16). The intensities of hay and perennial pasture usage are in turn directly correlated with operating costs as resources into feed production are increased to meet livestock needs. Increased costs and compound interactions with other cropping and livestock enterprises in these mixed farming businesses resulted in cattle profitability not being correlated to the share of cattle land resources applied to hay or perennials. This is expected since there are many other determinants of profitability in this highly complex beef cattle production system.

Table 16 **Correlations of hay and perennial intensities** and performance indicators where cattle occupies less than 50 per cent of the farm**

	kg LW/ha		DSEs/ha		Operating costs $/ha		Profit $/ha	
	Hay	Perennials	Hay	Perennials	Hay	Perennials	Hay	Perennials
Correlation coefficient	0.40	0.27	0.35	0.31	0.32	0.75	-0.09	-0.19
t-test ratio probability*	8%	24%	12%	17%	17%	0.1%	> 50%	> 50%

* Based on the null hypothesis of no correlation.

** Area of hay or perennials as share of cattle winter grazed area.

Perennials

The total area of perennial pastures on the 35 surveyed farms is 11,454 ha which, assuming a representative sample was surveyed, equates to around 50,000 hectares for the Esperance shire. This corresponds to approximately 8 per cent of the pasture area in the shire.

Perennials are more commonly utilised on the sandplain than mallee areas, although seventy per cent of sampled farms have perennial pastures. Of farms with perennials, the average area sown to these species is almost 460 ha with a median of 370 ha. Very few properties have just one species, most have two and some have up to six different species. At a regional level, of the 23 coastal farms, 20 use perennials with an average area of 500 ha and

almost 40 per cent of pastures grazed by cattle are planted to perennials. Fifty and thirty per cent of farms in the southern and northern mallee, respectively, use perennial pastures. Of the properties using these pastures, the respective average perennial areas for farms in these two districts is 470 ha and 25 ha corresponding to 40 per cent and 4 per cent respectively of their cattle winter grazing area.

Kikuyu is the most common component of perennial pasture in the Esperance region in terms of area sown (4195 ha) and number of properties with that species (15). Phalaris and veldt grass are the next most common perennial pastures being on six properties with a total of 2540 ha and 2110 ha, respectively. Couch and lucerne are grown on six properties but the areas involved (1150 ha and 320 ha, respectively) are much lower than for phalaris and veldt grass. The average area grazed on individual properties is around 280 ha for kikuyu, 420 ha veldt grass and 350 ha for phalaris (Figure 11).

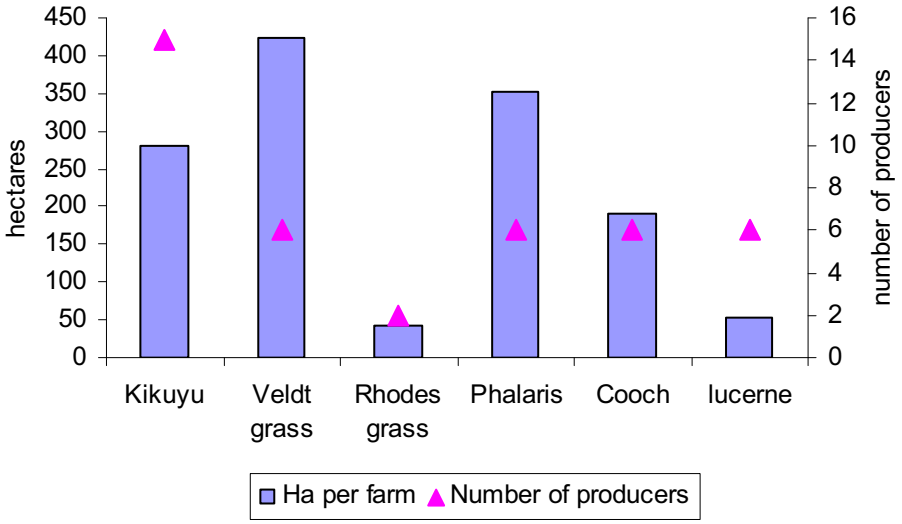

Figure 11 Perennials grazed.

Source: DAFWA Esperance Beef Survey

There is a high correlation between the area of perennials as a percentage of total pasture and the proportion of a farm's pasture grazed by cattle. There is also a high correlation between the proportion of perennials in total pasture and the share of total arable area allocated to the beef enterprise. These trends apply over the entire sample and for each of the three regions. This suggests that perennial pastures become increasingly important as beef becomes dominant in a farm's grazing enterprise and also in the overall farm business.

On most properties with perennial pastures, the intention is to increase the area sown to perennials. Across the entire sample, nearly two-thirds of producers plan to increase the area sown to perennial pastures. However, the degree of change is inversely proportional to the existing area sown to perennials, particularly for cattle specialist businesses. In addition, on farms where beef is the major enterprise, the intention is to increase perennial pastures where stocking rates are high and the current use of perennials is relatively low. Indications are that cattle producers on the coastal sandplain may eventually have up to 50 per cent of their pastures as perennial varieties. Also, the area of pasture sown to perennials on properties in the northern mallee may double to 10 per cent.

MANAGEMENT PRACTICES

Analysis of the sample distribution of farm performance indicators can provide clues to the underlying factors supporting profitable businesses. Even though only the cattle enterprise is examined, and the complex linkages to other enterprises is not accounted for, a partial analysis can show up management practices which are conducive to a profitable beef enterprise.

Productivity

At first it is helpful to look at the characteristics of enterprises in the top 30 per cent of producers ranked according to total profitability. Amongst this top 70th percentile of producers within each of the three districts, the relative contributions to each region's cattle industry are similar. This corresponds to around 60 per cent of each region's breeders and cattle grazing area. In absolute terms the top percentile along the coast has on average about 1000 breeders whereas in the southern and northern mallee they have 600 and 400 breeders, respectively. Also, amongst the top producers in the three districts, the average winter grazing cattle area is 2050 ha, 1250 ha and 2150 ha, respectively.

Table 17 **Percentile ranking by total profit**

	Sandplain	Southern mallee	Northern mallee
Percentage of individual region's profit—70th percentile (top 30%)	74	61	70
Profit of top 30%, $/ha	152 (14.1)	121 (47.1)	53 (17.0)
Profit of remaining 70% of producers, $/ha	59 (22.7)	65 (42.1)	30 (42.7)
Rate of return of top 30%, %	5.81 (15.6)	5.80 (46.6)	5.80 (19.0)
Rate of return of remaining 70% of producers, %	2.06 (21.7)	2.58 (39.9)	2.85 (32.8)
Stocking rate of top 30%, DSEs/ha	9.1 (4.9)	6.5 (19.8)	3.6 (22.2)
Stocking rate of remaining 70% of producers, DSEs/ha	7.9 (7.6)	5.9 (8.4)	3.6 (8.3)
Productivity of top 30%, kg/ha	201 (7.0)	145 (10.3)	70 (31.4)
Productivity of remaining 70% of producers, kg/ha	164 (8.2)	127 (10.8)	73 (29.3)
Total costs of top 30%, $/ha	152 (7.9)	112 (21.0)	46 (26.8)
Total costs of remaining 70% of producers, $/ha	229 (7.9)	142 (21.0)	76 (37.9)

( ) Relative standard error.

Table 17 shows that the top 30 per cent of cattle producers have about 70 per cent of the entire sample's beef enterprise profit. Average profit per hectare and rates of return on beef enterprise assets of these businesses are substantially higher than for those businesses outside this group. For sandplain farms this is due to lower production costs and higher productivity from greater stocking rates of the top producers. However, for mallee areas, the higher profitability is primarily due to the lower unit production costs of the more profitable businesses rather than from relatively higher per hectare live weight production.

The significantly higher per hectare profitability of the 70th percentile businesses suggests economies of scale exist. This is confirmed by the data in Table 18a showing that profit per hectare for both the sandplain and Esperance overall increases with increasing numbers of breeders and cattle area. For the sandplain this is mainly due to reductions in overheads on a per hectare basis (Table 18b). A negative correlation between herd size and overheads per hectare occurs as overheads are distributed across a larger asset base. However, stocking rate and productivity (kg live weight per ha) are independent of the size of beef enterprises.

Table 18a **Enterprise scale correlation with profit ($/ha)**

	Esperance		Sandplain	
	Cattle area	Breeder numbers	Cattle area	Breeder numbers
Correlation coefficient	0.32	0.48	0.37	0.46
t-test ratio probability*	6.4%	< 1%	8.7%	2.8%

* Based on the null hypothesis of no correlation.

Table 18b **Economies of scale, correlations**

	Esperance overheads ($/ha)		Sandplain overheads ($/ha)	
	Cattle area	Breeder numbers**	Cattle area	Breeder numbers
Correlation coefficient	-0.37	-0.40	-0.66	-0.66
t-test ratio probability*	3.1%	2.2%	< 1%	< 1%

* Based on the null hypothesis of no correlation.

** Only manager labour.

The declining terms of trade in agriculture has been addressed with farming having one of the highest productivity growth rates amongst all sectors of the Australian economy (Productivity Commission 2005). Therefore, a closer examination of factors associated with higher productivity can elucidate management practices which are favourable to both productivity and profitability of the Esperance beef industry.

The correlation between live weight production per hectare and size of beef enterprise is not strong. However, the beef enterprise financial performance is highly correlated to productivity in terms of live weight of beef produced per hectare (kg LW/ha) and stocking rate (DSE per winter grazed ha). Table 19 shows that for the entire survey sample, profit, gross margin, income, and production costs increase with improving productivity. These positive associations suggest enhanced investment is connected with increased live weight production and carrying capacity measures of productivity. These relationships operate for the mallee areas; however, for sandplain farms, profit and trading income increase with per hectare live weight production but costs of production and live weight productivity are largely independent.

Table 19 **Productivity correlations with financial indicators ($/ha)**

Correlation coefficient	Gross margin	Trading income	Total costs	Profit
with kg LW/ha	0.57 (< 1%*)	0.89 (< 1%*)	0.53 (< 1%*)	0.70 (< 1%*)
with DSEs/ha	0.63 (< 1%*)	0.85 (< 1%*)	0.67 (< 1%*)	0.54 (< 1%*)

* t-test ratio probability based on the null hypothesis of no correlation.

Increasing variable costs are associated with the gross margin increasing across the sample, however, profit and total production costs are not correlated. Yet, there is a strong inverse correlation between profit and overheads. This can be explained since profits (per hectare) increased with the scale of enterprise (Table 18) and fixed costs are distributed over a larger sized operation. Therefore, it can be concluded that live weight productivity is important for profitability as is the sufficient use of operating inputs and efficiency in their combination with overheads of the enterprise.

Management focus for productivity

Two-thirds of producers focus on their land resource as a principle driver of productivity. This is mainly through attention to pastures while one-quarter of farmers consider soil quality directly. In addition, on 15 per cent of businesses, general farm infrastructure is considered to be particularly important in ensuring high productivity.

Almost all producers regard some aspect of livestock management as critical in influencing productivity. Management through the breeding program is the most common way in which productivity is addressed. For example, heavy selection pressure applied to heifers occurs on one-third of the properties. Bull selection is seen as important in promoting productivity on about 20 per cent of farms and used by half the respondents to affect the marketing quality of cattle turned off.

Since there is a strong association between live weight productivity and profitability it is worthwhile to examine the livestock management practices which producers use to enhance productivity of their cattle enterprise. Focusing on breeder fertility, the main practices employed are strict culling policy, bull selection, replacement heifer selection, early joining heifers, ensuring that heifers at first mating are in suitable condition and pregnancy testing. Due to either the absence of such a focus or the lack of variability in fertility, the mallee areas are not analysed for this feature.

Among sandplain farms, high cow fertility resulted in land productivity of 204 kg LW/ha and profits of $131/ha compared to 165 kg LW/ha and $74/ha where such an emphasis did not occur (Table 20). Total production costs per hectare are similar whether or not a special emphasis was placed on breeder fertility. Therefore, the improved profits resulting from this focus is primarily due to enhanced live weight productivity.

Moreover, breeders producing high growth progeny profited $111/ha compared to $63/ha in situations where this is not a management priority. In the former case, higher profits resulted from lower variable costs of $86/ha versus $126/ha. Productivity and income were similar in the contrasting herds but the lower unit costs stemming from the more robust and efficiently producing animals led to higher profits where faster growth and vigour of progeny are major criteria for breeder selection.

Table 20 **Beneficial management practices on sandplain farms**

	Focus on breeder fertility			Focus on high growth weaners		
	Focus	No focus	t* %	Focus	No focus	t* %
Stocking rate	9.3	7.8	6.5%	8.68	8.01	34%
Productivity, kg LW/ha	204	165	4.0%	183	168	48%
Variable costs, $/ha	115	107	> 50%	86	126	5%
Trading income, $/ha	318	258	5.5%	273	278	> 50%
Total costs, $/ha	217	197	> 50%	177	237	5%
Profit, $/ha	131	74	10%	111	63	9%

* Based on the null hypothesis of no difference in sample means.

Two-thirds of the sample looked to their stocking rate as a means to achieving productivity goals. Most intend to increase their stocking rate in the short to medium term. Those who specifically targeted stocking rate not only gained higher stocking rates but also better productivity and profits (Table 21a). These businesses also had higher variable and overhead costs along with the very substantial advantages in trading income.

Three-quarters of the sandplain producers intend to increase stocking rate, compared with only one-third of those in the mallee. Farmers identified twenty different ways to enhance stocking rates; in particular, improving the quality of pastures and increasing the area sown to perennials. Other suggestions include increasing the fertiliser usage; reducing rushes and other major weeds; fencing off paddocks into smaller sizes to better use pastures; stricter culling of breeders; and better heifer selection to increase weaning percentages.

Table 21a **Beneficial management practices**

	Targeting stocking rate			Pasture focus		
	Yes	No	t* %	Yes	No	t* %
Stocking rate	7.9	5.4	< 1%	8.2	6.1	< 1%
Productivity, kg LW/ha	167	117	< 1%	178	126	< 1%
Variable costs, $/ha	100	56	< 1%	104	69	4.5%
Pasture costs, $/ha	33	17	< 1%	38	26	8.2%
Gross margin	147	96	1.3%	145	117	10%
Overheads, $/ha	91	57	2%	100	63	< 1%
Trading income, $/ha	264	186	< 1%	266	203	4.3%
Total costs, $/ha	192	115	< 1%	205	132	< 1%
Profit, $/ha	89	63	21%	81	80	> 50%

* Based on the null hypothesis of no difference in sample means.

Focusing on pasture management and incurring the associated higher costs enhanced productivity, trading income and the gross margin (Table 21a). Stocking rates tended to be higher than where pasture management was not noted to be a high priority. However, the greater outlay on overheads, other than the manager's labour input, by producers prioritising pasture management resulted in better profits not being achieved (Table 21a). Since it was mainly sandplain producers with high expenditures on pastures, their fixed costs such as shire rates and machinery dedicated to cattle production tend to be higher than elsewhere. This suggests that greater efficiencies in pasture utilisation and other aspects of the production system are needed along with the higher input pasture regimens.

Tactical weighing of cattle with the aim of enhancing productivity is used by 30 per cent of producers. On farms where this practice occurs, productivity and beef enterprise gross margin were significantly higher than otherwise (Table 21b). Variable costs were also higher as were overheads, which resulted in tactical weighing not effecting profit.

Table 21b **Beneficial management practices**

	Tactical weighing		
	Yes	No	t* %
Stocking rate	7.7	6.6	15%
Productivity, kg LW/ha	166	139	17%
Variable costs, $/ha	106	70	4%
Gross margin	155	111	3%
Overheads, $/ha	102	63	1%
Trading income, $/ha	268	204	4%
Profit, $/ha	78	84	>50%

* Based on the null hypothesis of no difference in sample means.

Research

Two hundred and twenty-four suggestions were collected on research topics that producers thought could provide significant benefits to the local beef industry. When collated, the 92 different research topics were divided into five major categories—pasture, livestock management, genetics, animal health and marketing (Figure 12). When the responses were ranked according to individual priorities, seven of the top ten research topics dealt with pasture management and use. This included perennial pasture establishment, rejuvenating pastures and livestock productivity and profitability from a balanced use of annuals and perennials.

From a genetic perspective, half of the producers suggested research topics into feed conversion efficiency. This included some interest in breeding for feed conversion efficiency. Other concerns included trace mineral nutrition and disease-related research on Bovine Virus Diarrhoea. On a regional level, most mallee producers expressed the need for research directly related to their particular environment since they perceived that the bulk of R&D in the Western Australian cattle industry has been concentrated in higher rainfall areas.

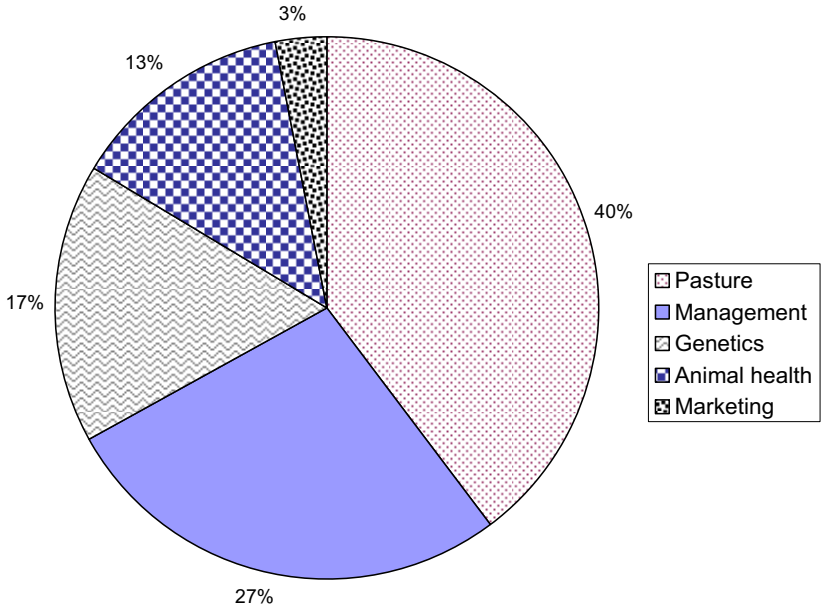

Figure 12 Research suggestions from beef producers.

Source: DAFWA Esperance Beef Survey

MANAGEMENT ISSUES

The survey covered general management issues such as timing of calving, grazing strategies, use of technology, risk management, training needs and producer intentions such as their future herd size.

Timing of calving

Two-thirds of producers in the Esperance shire begin calving in March, almost 20 per cent begin in February and 10 per cent in April. About a quarter of breeders actually calve in March, another 30 per cent do so in April and 25 per cent in May (Figure 13). Generally calving occurs over two months but in some cases it takes up to three months. Calving is mostly finished by the end of May, although almost a quarter of properties continue through to mid-winter. In 50 per cent of businesses, timing of calving is linked to pasture growth being substantial by early winter and the need to minimise hay fed out over summer and autumn. Marketing arrangements are also a major consideration in deciding time of calving. Autumn calving is suitable for producers turning off weaners for late summer/early autumn and carrying over grass finished animals for selling in August/September.

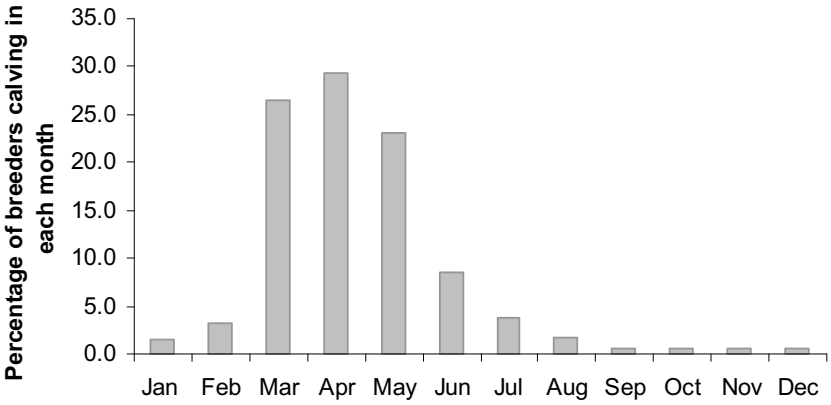

Figure 13 Time of calving, monthly % distribution for breeders.

Source: DAFWA Esperance Beef Survey

Grazing management

Grazing management is a critical part of the beef enterprise. Deferred grazing is defined as moving stock onto new paddocks when the overall level of feed in a new area is considerably ahead of that in the grazing paddock and the quality of feed on ground is taken into account. Set stocking is where cattle are kept in paddocks until the feed ahead does not keep up with grazing pressure and attention is not generally given to the quality of feed on offer.

Rotational grazing with stock moved into paddocks according to the optimum growth stage of pastures is not carried out to any significant degree by the surveyed producers. Set stocking occurs on more than half the surveyed properties with stock often left in a paddock for well over one month. This type of grazing occurs on nearly all the mallee farms and 40 per cent of sandplain properties. On sandplain properties, there was no difference in productivity and financial performance between farms using set stocking and those who claimed to employ deferred grazing. This suggests that the potential benefits from deferred grazing are not being achieved. However, since detailed information on grazing days and leaf or biomass stages were not surveyed, the true application of deferred grazing cannot be assessed.

Annually, on almost all properties, there is some period of pasture feed shortage. Two-thirds of respondents felt that autumn was the critical period while one-quarter indicated this occurred in winter. Most sandplain producers considered there was an excess of feed during spring. However, mallee producers and almost 20 per cent of those in the coastal sandplain region indicated that in most years they did not have excess pasture.

Hay is fed out on all but three of the surveyed properties. Putting cattle onto stubbles was undertaken on two-thirds of the properties growing crops. In addition, summer-active perennials reduced the degree of feed shortages on nearly 60 per cent of properties. Some businesses used fixed mob sizes as a strategy to manage feed demand and availability. Also around 30 per cent of respondents avoided excess feeding before calving, particularly for first-time calving heifers.

In the day-to-day handling of livestock, pasture condition and keeping sufficient feed ahead of the animals are the main guides to paddock stocking management. Fifty per cent of producers examined pastures and altered grazing intensity to more efficiently utilise pastures. Considered over the entire sample such a strategy results in a gross margin of $150/ha and stocking rate of 7.7 DSE/ha compared to $110/ha and 6.5 DSE when not proactively changing grazing pressure to better use pastures.

Use of new technology

One-third of producers indicated they have employed new technology in recent years to assist with herd management. In most cases this was some form of weighing equipment linked to computer recording. Other newly introduced technology included cattle crushers and computerised cash management systems.

Risk management

Nearly 70 per cent of producers stored sufficient hay for two seasons. Half of the respondents make hay from locking up pastures with standard fertiliser treatment while one-third make hay from well-fertilised pastures and/or hay crops.

Pregnancy testing occurs on half the properties with some farmers doing it themselves but the majority obtaining professional help.

One-third of producers have both sheep and cattle to more effectively graze pastures and control worms but also as an income diversification strategy.

Risk management through stocking according to rainfall is practised directly on one in five properties. In managing seasonal variability, another 20 per cent of businesses use a conservative approach in regard to stocking rates.

With respect to water supply, using bores and/or having interconnected systems to prevent individual dams or watering points from drying out are used on one-third of surveyed properties. Revitalising catchments or cleaning out dams is part of water management on about one in four properties.

Risk management using marketing strategies other than enterprise diversification occurs on about one-third of properties. This includes selling on-farm, selling direct to an abattoir or feedlot, and targeting weaner sales marketing days. These producers hope to achieve a better price than from auctioning their cattle at distant sale yards. However, full advantage of these strategies is not being made since their use makes very little difference in price per kg and profitability.

Producers were canvassed as to how they may respond if beef cattle prices weaken in the future. The most common responses were to increase stocking rate and improve cost efficiency of operations. In addition, one-third of the sample currently focuses on cost minimisation as a risk management strategy. These businesses, which are distributed evenly across the sandplain and mallee, have, on average, slightly lower stocking rates and cattle receipts compared with other enterprises. However, lower operating costs resulted in profits being similar for those who did or did not use this strategy.

Training needs

Three-quarters of producers indicated that further training would be helpful to improve their management of the beef enterprise. About thirty different topics were suggested covering areas such as animal production, pasture improvement, administration and financial management. In terms of animal production, items such as pregnancy testing, AI, bull and heifer selection, animal husbandry and handling were most commonly mentioned. Learning about establishing and maintaining perennial pastures, the nutritional benefits/balance that livestock derive from pastures and rotational and deferred grazing were cited as being particularly useful. Areas of interest in business management included record keeping, computer skills and the use of financial and grazing management computer programs.

Herd size intentions

Sixty per cent of producers intend to increase breeder numbers while the remainder will keep their herd size constant. At a regional level, half of the mallee businesses are likely to increase numbers while two-thirds of the coastal producers plan to increase herd size. Almost half of those who intend to increase numbers also plan to improve land use efficiency on their farm. Thus part of the increase will occur with improved efficiencies enabling enhancement of stocking rate and part due to increased land allocated for cattle.

Those who intend to increase herd size have a greater share of business income from cattle, pasture area allocated to cattle, area sown to perennials and existing herd size. However, stocking rate, perennial intensity, unit live weight productivity, costs of production and profitability are similar whether or not farmers intend to change herd size.

Necessary improvements to the production system

Farmers were asked what improvements over the short and medium terms would enhance their beef production system. Their responses covered measures considered by them as relatively easy to implement and others that could be more difficult to achieve.

The most commonly mentioned immediate improvement is better fencing in maintaining the overall farm infrastructure. This was closely followed by sowing of improved pasture varieties and increasing the area sown to perennials. In addition, many farmers see the need to invest in their cattle yards and improve the water supply. Over the longer term, one-third of producers are considering to increase the area of perennials. Improvements to water supply capacity and delivery, pasture rejuvenation and replacement of older fencing were also considered to be longer term needs in one-quarter of businesses.

About half of the producers reported they have some necessary but difficult to implement improvements but there was little commonality between respondents. Better genetics and better ways to use pasture more effectively, along with claying and better water delivery systems were the most frequently mentioned.

Adverse influences

One-third of producers consider that an outbreak of exotic disease would have the most harmful impact on their individual business. Although the current expression of disease is very low, farmers feel that the threat is always present and high vigilance is essential. The next most common factor to minimise is poor bull performance, particularly in the smaller herds where there is little spare capacity in terms of the number of standing mature bulls. Low cattle prices are seen as the next most likely threat to eventuate. Drought, excessive wildlife populations and deteriorating qualities of water supply and soil may also adversely affect cattle businesses. Producers are generally implementing their own strategies to address these environmental issues. Finally, excessive regulation impinging on farming activities and general business activity is seen as having a detrimental effect on profitability and business prospects.

Environment

All producers monitor environmental conditions on their property and reported current or potential degradation issues. Wind erosion, waterlogging and emerging dryland salinity are the most commonly observed environmental issues with each occurring on almost 30 per cent of properties. Low soil pH and pasture degradation are also seen as significant problems on about one-quarter of farms. In addition, weeds such as reeds and love grass are perceived to reduce productivity on some properties. Emus and kangaroos also damage fencing on some properties.

More than half of producers closely monitor their pastures and vulnerable areas on their farm for the impact of particular environmental effects. Sensitive areas including creek lines, bush, saline scalds and the existing and potential areas of degraded pasture are watched. In particular, 30 per cent of farmers regularly monitor soil health and carry out intermittent soil testing. However, since most farmers acknowledge areas of low pasture productivity, it is likely that soil testing would be broadly beneficial.

Farm constraints and advantages to beef production

Across the survey sample, 40 different constraints to beef cattle production were identified, with six limitations cited the most. Almost 40 per cent of farmers suggested that the carrying capacity of their pastures is below their potential. This may be the result of inefficient grazing management and/or pastures not achieving their potential growth, biomass and nutritional level. Deficiencies to water supply and delivery constrain production on one-quarter of properties. Poor fencing, high land prices and limited capital were quoted as constraining production for one in five businesses. Environmental issues such as the presence of reeds, lovegrass, waterlogging and non-wetting sands are also seen as significantly holding back production on a number of farms.

Production limitations due to deficiencies in water supply and pasture carrying capacity are perceived in all areas. However, some regional differences are noteworthy, such as high land prices and environmental factors being seen as constraints on the sandplain but not elsewhere. On the sandplain, where producers regard pasture to constrain production, the median share of perennials in total pasture was 8 per cent compared with 40 per cent where pasture is not considered a limiting factor.

Thirty different advantages were identified by producers with about ten commonly mentioned. Twenty nine of the 35 interviewees believe that the climate of reliable rainfall and mild temperatures provides a distinct advantage for their beef enterprise. Good quality pasture,

favourable soil types and good water supplies were also cited by more than half the sandplain farmers and most of those in the mallee as supporting good productivity. Suitability to perennial pastures, adequate farm infrastructure and good logistical facilities in the region are also seen as important factors supporting the Esperance beef industry.

INDUSTRY SITUATION—Farmers' perspectives

Producers were asked their opinion on the local beef industry's strengths and the constraints limiting its development. Potential threats to the industry were also canvassed. In addition, suggestions on goals for the local industry were recorded.

Strengths

Availability of local feedlots and good transport facilities to adjacent shires favour the Esperance region's weaner production industry. The concentrated period of calving in the shire gives rise to large numbers of straight line cattle for sale to feedlots. Such consistency of supply facilitates orderly arrangements throughout the supply chain through to retail and export markets. In the past, the region's annual weaner sale days also provided certainty for producers and showcased the district's industry.

The general good health and quality of cattle throughout the local herds provides marketing benefits. In addition, eastern states markets provide viable alternatives for selling livestock from Esperance and competition for Western Australian buyers. Finally the physical environment of a mild climate and reliable rainfall is favourable to the industry.

Experienced and well organised local stock agents give producers confidence that their interests are being upheld. Local livestock transporters and commercial veterinarians are also regarded as providing good services. The lot feeding sector is considered to be the local industry's foundation either in terms of producers supplying directly or as a major component of the market framework supporting the beef industry. About one in five businesses are substantially reliant on supplying directly to abattoirs but the majority sold weaners to feedlots. In terms of genetics stud producers and the EBV system were recognised by about half of the survey respondents as an important contribution to industry development.

Weaknesses

There are a number of weaknesses and threats that need addressing in order to promote the industry's sustainability and development. The most commonly perceived weakness is supermarket dominance in combination with the high reliance on the domestic market put downward pressure on farm gate prices. This is seen to be exacerbated by the limited capacity of the local abattoir to handle cattle and that it is not currently rated for export slaughter. Producers also feel that their market power has been reduced with the reduction in the number of abattoirs in the state over recent years limiting competition. Respondents also feel that export opportunities are not being fully accessed which dampens the overall prices for cattle in the state.

The relatively inactive local BIA group and a general lack of cooperation among producers may be inhibiting development of the industry. In addition producers consider that the local industry is being held back with price penalties unchallenged at processors and the absence of regional identification at a retail level.

The main threats to the industry are perceived to be growth of the plantation tree sector and the possible introduction and spread of bovine disease. High fuel prices and excessive regulation within the industry are also seen as real threats to profitability in the industry. Without upgrading the local abattoir to increase its cattle slaughtering capacity and its export certification, producers foresee farm gate prices not improving.

Goals

Almost 50 per cent of farmers interviewed mentioned that extension of practical production information suited to sandplain and mallee areas should be a major goal of the local industry. This could be in cooperation with the Department of Agriculture and Food (DAFWA) but under control of the local producers. In addition, development of a more transparent and fairer auction system, and consumer education regarding appropriate meat preparation and cooking are seen as worthwhile goals.

Only about one-quarter of the farmers interviewed thought that the local beef improvement group could be effective in achieving local industry goals. The national organisations BIA and MLA are thought to be less relevant than the local group in achieving medium term goals. About half the producers feel that a new group needs to be established. Existing social or friendship groups could form the linchpin of the new beef development group. Even informal social groups could have an important role focused on achieving local goals. About half of the producers think that an industry 'champion' is essential to drive new developments. That person would not necessarily be from DAFWA but that organisation could have a supporting role as per the current ASheep program. It was stressed that any new endeavour should be production orientated.

Industry support from MLA and DAFWA

Producers were asked for their views on the effectiveness of Meat and Livestock Australia (MLA) and DAFWA on the performance of their beef enterprise. Two out of five respondents believe that the MLA has been effective in supporting their business. Sixty per cent of producers indicated that DAFWA provides support for their cattle business, ranging from specific issues such as pastures, animal health or water supply to a role ‘in the background'. About one-third consider only DAFWA provides support, while 15 per cent feel that only the MLA gives support. Almost 30 per cent indicated that neither organisation made a significant impact on their beef enterprise.

APPENDIX

Methodology

Due to the large differences in rainfall and beef production systems between sandplain and mallee districts, these areas were sampled separately in order to make valid comparisons to investigate the influences driving profitability. The relative number of sampled farm businesses with beef cattle in each of the three regions is about the same as that in the Esperance population. This stratified random sampling provides fairly representative data from cattle producers in the Esperance shire for quantitative and qualitative observations. Thus the statistics derived from the sample give a balanced picture of the industry. Of the 35 sampled businesses, 23 are from the sandplain and six each are from the southern and northern mallee which represents about 20 per cent of beef producers in each region.

Correlation provides a measure of the relationship between two variables, although it does not necessarily imply a causal association. The correlation needs to be large enough so that there is a degree of confidence that it is true. For example, in a sample size of 35 the correlation coefficient needs to exceed 0.30 before we can be 90 per cent sure that it is true. When the correlation is significant the assumption is that the pair of observations is from a bivariate normal distribution and that Student's t-distribution provides a statistically valid test (Snedecor and Cochran 1971). The p value in this test represents the probability that there is no correlation between the variables. A p value of less than or equal to 0.10 (10%) in this study is considered an acceptable level of significance to reject the null hypothesis of no correlation occurring. In addition, Student's test is used to compare means of key variables amongst producers using contrasting management alternatives. Where it is included in tables in the report, the p value is indicated by 't–test ratio probability' or just 't %'.

Survey Questionnaire

The survey was carried out by face-to-face interview with operator-managers of the businesses selected in the stratified random sampling process.

Survey number:

Property name:

Manager:

Marketing

Do you monitor prices of different markets and livestock classes and if so what do you do with this information? Do you record the price information?

What markets do you target?

Do you background cattle for selling into feedlots?

Do you use the MLA/SFE beef futures market?

When targeting market specifications what generally is the per cent of actuals to the target standard?

What percentage of sales target MSA?

What technology have you introduced recently to make marketing your cattle easier or more effective?

Do you buy store cattle for finishing? If so, what markets do you aim for?

Have you had any difficulties in the process of complying with NLIS?

Do you need assistance to achieve benefits from complying with NLIS?

What QA programs do you put into practice?

What are your current main selling months?

Do you plan any changes to marketing arrangements, sales schedule or targeted markets in the future?

Lifestyle

What are the main benefits beef production gives to your farm enterprise and lifestyle?

Do you have a business plan which you regularly review and act upon?

Do you plan to retire within five years and if so pass the farm onto your family or otherwise sell the operation?

Cattle Breeding

What breeds do you use?

- Bulls for bull stud
- Breeders for bull stud
- Bulls over breeder herd
- Breeders

Do you maintain comprehensive breeding records?

Do you have an objective breeding program? Briefly describe its main criteria and objectives and how the program is implemented.

What breeding traits do you look for in purchasing/selecting bulls and cows?

Production system

What linkages are there between your cattle and other enterprises on the farm?

Yes/No: Linkages

How many weeks do you run cattle on crop stubbles?

Do you rotate sheep and cattle on the same pastures separately, together or not at all?

What is the relative contribution of cattle compared to other enterprises in the scale (resources and receipts/income) and profitability of your farm business and do you anticipate any changes in size of your cattle enterprise in the short term?

- Resources:
- Receipts/income:
- Profitability:

What changes to the scale and mix of the cattle enterprise do you plan for over the next five years?

What parts in your beef production system are open to improvement in the short term and long term?

What places in your beef production system is it difficult to make improvements now and in the long term?

Are there any matters that could develop in your production system having a detrimental effect on your cattle enterprise?

Do you monitor and record environmental conditions on your property? Have you noticed any particular environmental problems?

What areas and species of perennials are grazed by cattle?

Do you plan to change the area of perennials in the near future?

What do you see as the main constraints on your farm to beef production?

What do you see as the main advantages on your farm which support beef production?

What areas of research would assist to improve productivity and profitability of your beef enterprise?

Management

When do you calve and why at that time?

Do you intend to increase the herd size or make other changes to herd composition?

What is the frequency with which you weigh various classes of cattle?

What management options do you use to best utilise pastures for meat production?

(Varying grazing intensity and calving time.)

What grazing strategy do you use (set stocking or rotational/deferred grazing)? What criteria do you use to move stock between paddocks?

When do you have excess and shortages in pasture? How do you match the seasonal supply and demand for feed?

Do you lot feed your own cattle?

Do you estimate your cost of production per kg of beef produced?

Do you estimate separately the fixed and variable costs per kg of beef production?

What risk management strategies do you have to identify and manage the main factors affecting profitability?

How do you plan to respond to the possible decline in beef prices that could occur as North and South American exports increase in coming years?

What technology have you introduced recently to make the enterprise easier to manage physically and financially? (Include decision support tools such as cattle weighing devices, computer programs and recording systems as well as production technologies.)

Do you intend to make any changes to management of the herd?

What skills training would you like to undertake to help improve your management of the beef enterprise?

Productivity

Do you aim to consistently improve feed conversion efficiency of the herd?

What is your enterprise's overall pregnancy percentage? What is your enterprise's overall weaning percentage? Is there scope for improvement?

Do you aim for an annual increase in stocking rate? If so, what measures are in place to bring this about?

What facets of production do you focus on to gain productivity and price improvements?

What business, production and product quality performance criteria do you focus on in operating your cattle enterprise?

Why are these criteria important from a business and life style point of view?

In relation to these criteria (previous two questions), can you specify some performance targets?

What have you in place to achieve and monitor these target goals?

Industry

How does the beef industry through its institutions and economic structure support your enterprise?

What do you see as the main constraints at the industry level to your beef production?

Do you consider there are any broad goals that the local industry should aim to achieve?

Is there an existing network that could set and achieve those industry goals?

Does this existing network need any changes to implement these goals?

What do you see as weaknesses of the local industry and are there any threats developing that could harm the cattle industry locally and more generally?

What do you see as the strengths of the local industry and are there any opportunities developing that could benefit the cattle industry locally and more generally?

Does DAFWA support your cattle business in any way?

Does MLA support your cattle business in any way?

Would you be willing to support an approach to funding organisations to finance RD&E in your area? Would you support RD&E arising from that funding?

Financial and production information

For each property data was collated on herd size and structure and the area grazed by cattle during winter. The volume and value of sales for each class of cattle were collected along with the operational and overhead costs of production. This information was used to derive productivity and financial data on a per hectare basis to enable comparisons across the beef enterprises. Where sheep are part of a business, the area of winter grazed hectares allocated to cattle is based on their relative share of DSEs carried on the property.

Included in operating or variable inputs are costs of pasture treatment (fertiliser, etc.), hay production, grain feeding, fuel, marketing, animal husbandry and livestock purchases excluding breeders. Overheads cover items such as shire rates, licenses, administration, insurances, operator/manager labour, permanent and casual labour, maintenance and depreciation. Profit incorporates the value of sales and the annual change to value of livestock held on the property minus operating and overhead costs but excludes interest resulting in a full equity figure.

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