



Australian lamb

09.1

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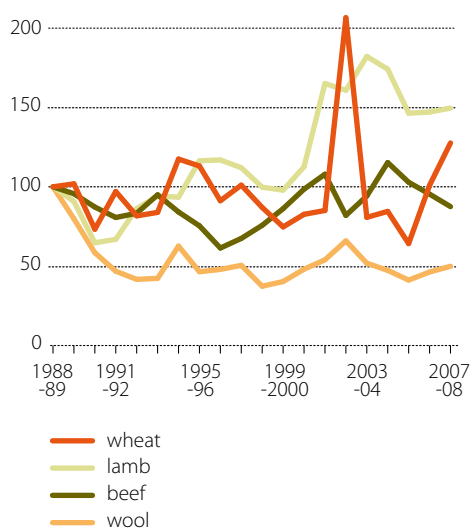
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Financial performance of slaughter lamb producing farms 2006-07 to 2008-09

Strong international demand and constrained supplies of Australian lamb because of adverse seasonal conditions have resulted in domestic lamb prices remaining at historically high levels in 2007-08 (figure a). While lower wool production and some increase in demand have resulted in wool prices gradually recovering in recent years, they remain relatively low in real terms. Australian broadacre sheep producers have responded to the relative prices of lambs and wool by reducing the national sheep flock and dedicating a greater number of sheep to producing slaughter lambs. Consequently, the number of lambs slaughtered in 2007-08 was 24 per cent more than a decade earlier, despite sheep numbers falling by 31 per cent and a reduction in lambing rates because of drought in parts of Australia (table 1).

a Index of commodity prices



The average slaughter weight of lambs has increased in recent years, largely reflecting the greater focus on the production of first cross and speciality meat breeds of sheep. In 2007-08, the average slaughter weight was 20.3 kilograms. This is 4 per cent higher than a decade earlier but 2 per cent lower than in 2006-07 as the drought restricted producers' capacity to finish all of the lambs sold for slaughter. Reflecting the increase in production and strong international demand for Australian lamb, lamb meat exports increased by 77 per cent over the decade to 2007-08.

Detailed estimates of production and farm financial performance are used to highlight the effect of the adverse seasonal conditions in recent years on slaughter lamb businesses. In particular, this report focuses on slaughter lamb producers' capacity to continue to invest in new capital to expand lamb production and productivity.

For the purposes of this report, broadacre farms are classified as being slaughter lamb producing farms if they sold more than 200 lambs for slaughter in a year. To investigate the physical and financial

1 Sheep numbers and lamb production

	sheep numbers million head	lambs slaughtered '000	slaughter weight ^a kg/head	lamb meat production ^a kt	lamb meat exports ^a kt
1999	115	16 346	19.5	319	101
2000	119	18 507	19.9	368	125
2001	111	17 897	19.7	353	125
2002	106	17 086	19.8	338	116
2003	99	16 430	20.1	330	123
2004	101	16 675	20.4	340	131
2005	101	18 228	20.6	375	170
2006	91	19 483	20.5	400	176
2007	86	21 154	20.8	439	193
2008	79	20 342	20.3	414	179
% change between 1999 and 2008	-31	24	4	30	77

^a Carcass weight.

Sources: ABS, *Agriculture, Australia*, cat. no. 7113.0, Canberra; ABS, *Agricultural Commodities, Australia*, cat. no. 7121.0, Canberra; ABS, *Livestock Products, Australia*, cat. no. 7215.0, Canberra; Department of Agriculture, Fisheries and Forestry, *Export Statistics*, Canberra; ABARE.

characteristics of slaughter lamb producers of differing scales surveyed by ABARE, farms have been classified into four groups based on the number of slaughter lambs sold:

- **small scale farms:** 200 to 500 lambs sold for slaughter
- **medium scale farms:** 500 to 1000 lambs sold for slaughter
- **large scale farms:** 1000 to 2000 lambs sold for slaughter
- **very large scale farms:** more than 2000 lambs sold for slaughter.

Between 2001-02 and 2007-08, an average of 23 000 broadacre farms sold lambs for slaughter (table 2). Almost one-quarter of these farms sold fewer than 200 lambs for slaughter and accounted for just 3 per cent of the value of slaughter lambs produced by broadacre producers. On average, these producers generated less than 1 per cent of farm cash receipts from the sale of slaughter lambs and have been excluded from the analysis. In contrast, just 7 per cent of producers sold more than 2000 lambs for slaughter and accounted for 34 per cent of the value of broadacre slaughter lamb production.

2 Distribution of broadacre slaughter lamb producing farms, 2001-02 to 2007-08

by number of slaughter lambs sold

	number of producers	share of producers	share of slaughter lamb value of production
	no.	%	%
<i>less than 200</i> slaughter lambs	5 553	24	3
200 to 500 slaughter lambs	6 516	28	12
500 to 1000 slaughter lambs	6 161	27	25
1000 to 2000 slaughter lambs	3 293	14	26
<i>more than 2000</i> slaughter lambs	1 516	7	34
Broadacre producers	23 038	100	100

Note: The ABARE survey only includes broadacre farms with an EVAO greater than \$40 000.

Characteristics of slaughter lamb producers

Broadacre slaughter lamb producers generally manage highly diversified businesses which include the production of a mix of broadacre commodities including lambs, wool, sheep, beef cattle and crops. However, the decision to increase their farms' specialisation in slaughter lamb production is associated with some significant changes in farm management practices including flock demographics, management of sheep reproduction and feed availability.

The increased focus on slaughter lamb production is associated with significant changes in flock composition (table 3). That is, the female proportion increases in order to maximise the number of ewes available for breeding, and the proportion of wethers decreases as the scale of slaughter lamb production increases.

The greater focus on lamb production is also associated with an increase in the proportion of ewes mated and the number of lambs produced per 100 ewes mated (lambing rate) (figure b). This latter observation generally reflects an increase in the use of non-merino rams to mate with first cross ewes which have a greater incidence of twinning, greater reliance on improved pastures and supplementary feeding to enhance ewe fertility and reduce lamb mortality rates.

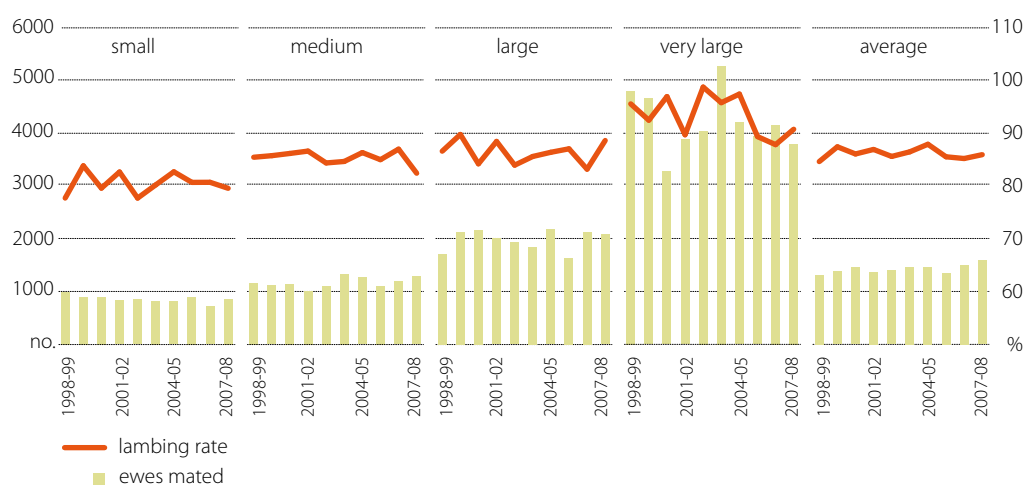
Between 2001-02 and 2007-08, very large slaughter lamb producing farms, on average, had almost four times more sheep than their small scale counterparts. However, the effect of the changes in flock management resulted in these farms, on average, selling almost 11 times more lambs for slaughter. In addition to producing more lambs for sale, very large scale farms realised a 4.6 per cent price premium in real terms for their prime lambs, reflecting the production of lambs specifically bred and finished for slaughter (table 3).

However, the greater focus on lamb production is associated with a decrease in wool production and quality. The average wool cut per sheep shorn fell, on average, from 4.3 kilograms for very small scale farms to 4 kilograms for very large scale farms in the seven years to 2007-08 (table 3). This largely reflects the steady increase in the proportion of sheep being shorn as lambs as the scale of slaughter lamb production increases. In addition to producing less wool per sheep shorn, first cross and meat breed sheep generally produce coarser, lower value wool. Consequently, very large slaughter lamb producing farms realised, on average, a 12 per cent lower wool price in real terms than their small scale counterparts in the seven years to 2007-08 (table 3).

3 Physical characteristics, 2001-02 to 2007-08, by number of lambs sold for slaughter average per farm

		small	medium	large	very large
Area operated	ha	1 515	2 167	3 403	4 781
– sown to crops	ha	452	539	642	847
Number of beef cattle, 30 June	no.	93	91	159	340
Number of sheep, 30 June	no.	1 685	2 188	3 512	6 630
– rams	%	1	1	1	1
– ewes	%	53	57	60	61
– wethers	%	20	15	10	9
– lambs	%	25	26	29	28
Numbers of ewes mated	no.	823	1 178	1 952	4 103
Lambs marked	no.	663	1 001	1 682	3 778
Lambing rate	%	81	85	86	92
Number of sheep and lambs sold	no.	699	1 183	2 039	4 821
Number of lambs sold	no.	366	730	1 396	3 712
– prime lambs	no.	234	463	952	2 841
– other lambs for slaughter	no.	103	239	407	827
– lambs not for slaughter	no.	29	28	37	45
Number of sheep and lambs shorn	no.	1 820	2 377	3 906	8 086
Wool production	kg	7 893	10 187	16 531	32 213
Wool cut per sheep shorn	kg/head	4.3	4.3	4.2	4.0
Average price received					
Wool	c/kg	600	568	564	529
Adult sheep	\$/head	58.8	53.9	49.6	50.1
Prime lambs	\$/head	81.1	83.0	83.1	84.8

b Number of ewes mated and lambing rate, by number of lambs sold for slaughter average per farm

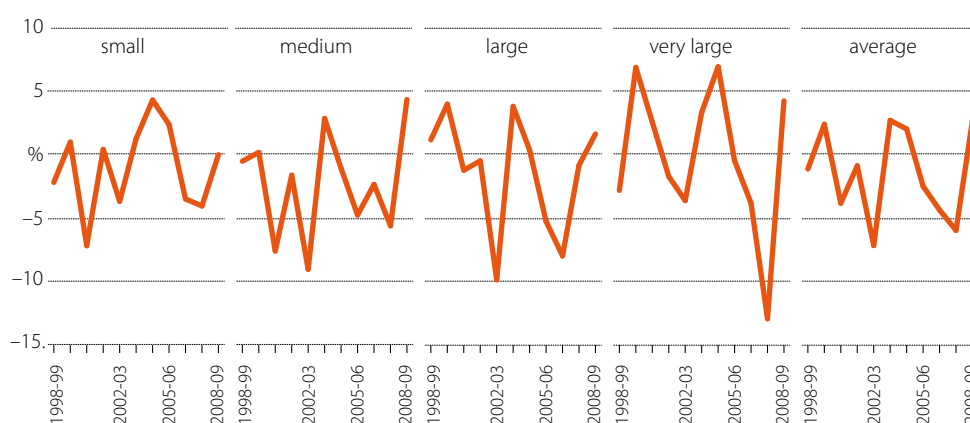


Slaughter lamb production

In recent years, favourable lamb prices have resulted in more slaughter lamb producers focusing on the production of prime lambs. Poor wool prices and adverse seasonal conditions, most recently in 2007-08, have resulted in a steady decline in sheep numbers in Australia over the past two decades. In 2007-08, hot and dry conditions in south-eastern Australia – which includes many of the main prime lamb producing regions in Australia – resulted in reduced on-farm feed supplies and many slaughter lamb producers increasing their turn-off rates for sheep and lambs to limit fodder purchases. Consequently, sheep numbers on prime lamb producing farms fell, on average, by 5 per cent in 2007-08 (figure c, table 4).

While lamb turn-off rates increased in 2007-08, the number of prime lambs sold fell, on average, by almost 13 per cent to 778 head per farm (figure d and table 4) as a greater proportion of the lambs sold were turned off earlier in

C Change in sheep numbers, by number of lambs sold for slaughter



4 Selected physical characteristics, slaughter lamb industry, ranks by slaughter lambs sales

average per farm

	area operated ha	change in sheep numbers a %	ewes mated no.	lambing rate %	sheep and lambs sold no.	prime lambs sold no.	other slaughter lambs no.	area sown to crops ha	change in beef cattle numbers a %
Small									
2006-07	1 503	-3.1	822	79%	736	283	71	555	0.0
2007-08	1 882	-3.3	947	78%	774	208	121	489	1.9
2008-09	1 876	1.0	935	na	800	na	na	434	3.3
Medium									
2006-07	2 052	-1.6	1 274	87%	1 190	567	164	612	-2.5
2007-08	4 007	-4.6	1 339	82%	1 382	445	270	744	-4.1
2008-09	4 624	4.4	1 288	na	1 107	na	na	720	2.3
Large									
2006-07	3 691	-7.6	2 165	83%	2 276	1126	346	813	-7.7
2007-08	3 894	-0.1	2 102	89%	2 077	931	411	636	2.9
2008-09	2 829	1.4	2 011	na	1 903	na	na	576	-3.3
Very large									
2006-07	3 880	-2.7	4 362	88%	5 057	3247	643	1 147	8.1
2007-08	4 186	-12.2	3 879	91%	5 007	3016	700	921	-0.4
2008-09	4 289	4.2	3 622	na	4 274	na	na	759	-3.3
Average									
2006-07	2 373	-3.6	1 653	85%	1 700	897	222	694	-0.1
2007-08	3 337	-5.2	1 678	86%	1 768	778	304	662	0.2
2008-09	3 321	2.9	1 616	na	1 567	na	na	603	-1.0

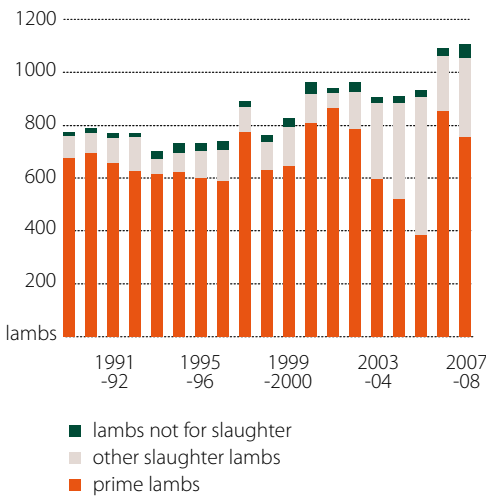
a Change in animal numbers between 1 July and 30 June.

the season prior to being fully finished. Consequently, the number of non-prime lambs sold for slaughter in 2007-08 increased by 37 per cent to average 304 head per farm.

Some improvement in seasonal conditions in 2008-09 is projected to boost on-farm feed production and will enable many producers to commence rebuilding their sheep flock. Consequently, sheep numbers on slaughter lamb producing farms are projected to increase, on average, by almost 3 per cent in 2008-09. The recovery in animal numbers is expected to be strongest on those farms which destocked the most in 2007-08. That is, medium and very large scale slaughter lamb producers.

In 2008-09, lamb production is likely to remain at similar levels to 2007-08 as a decline in the number of ewes mated offsets the effect of higher lambing rates. This, combined with a reduction in lamb turn-off rates to rebuild animal

d Lamb sales, slaughter lamb industry average per farm



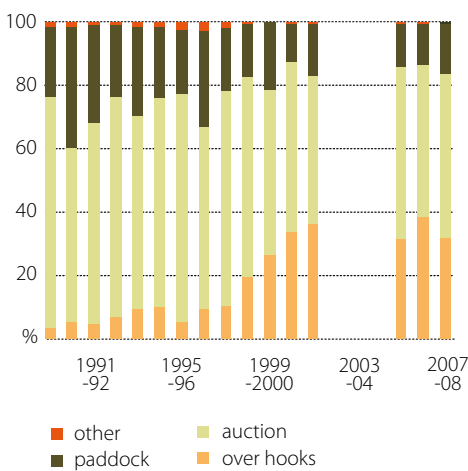
numbers, is expected to result in total lamb sales falling in 2008-09. However, a recovery in the proportion of finished lambs sold is expected to result in sales of prime lambs increasing and sales of non-prime lambs for slaughter falling in 2008-09.

Selling methods used for adult sheep and lambs

Over the past decade, the greater focus on the production of lambs specifically bred for slaughter, as well as finishing lambs prior to sale, has resulted in producers changing their method of sale (figure e). In the early 1990s, almost all of the lambs produced on slaughter lamb producing farms were either sold via auction or in the paddock. The proportion of lambs sold over the hooks has increased from less than 5 per cent of lambs sold in the early 1990s to around one-third of lamb sales in 2007-08. Conversely, the proportion of lambs sold in the paddock or via auctions has contracted to around 62 per cent of lamb sales in 2007-08.

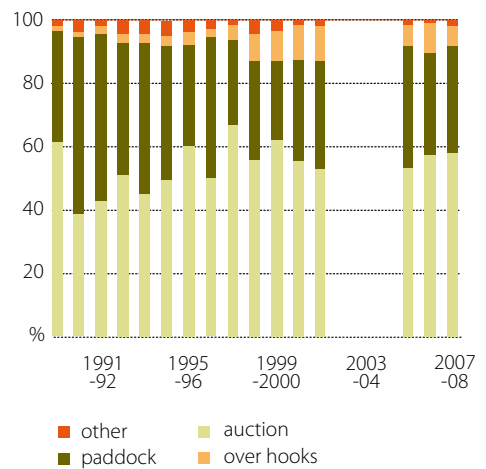
The production of more meat breeds of sheep also appears to have resulted in some changes in the method used to sell adult sheep (figure f). Historically, adult sheep have either been sold in the paddock or via auctions. During the late 1990s and early 2000s, the proportion of adult sheep sold over the hooks has been increasing. In the three years to 2007-08, slightly less than 10 per cent of adult sheep were sold over the hooks.

e Lamb selling methods, slaughter lamb producing farms average per farm



Note: Because of changes in the data collected, consistent results cannot be provided for the period 2002-03 to 2004-05.

f Adult sheep selling methods, slaughter lamb producing farms average per farm



Note: Because of changes in the data collected, consistent results cannot be provided for the period 2002-03 to 2004-05.

Farm performance in 2007-08 and 2008-09

2007-08

In 2007-08, farm financial performance in the slaughter lamb industry is estimated to have strengthened from the poor outcomes recorded in 2006-07 (figure g). Slaughter lamb producers are estimated to have realised average farm business losses of \$14 900 a farm, compared with an average loss of \$70 713 a farm in 2006-07 (table 5). This improvement reflects a strong recovery in farm cash receipts relative to farm cash costs.

g Financial performance, slaughter lamb industry average per farm



Farm cash receipts are estimated to have increased by 6 per cent because of increased sheep, lamb and cropping receipts. Higher sheep and lamb turn-off rates, combined with slightly higher prices, boosted total sheep and lamb receipts despite fewer prime lambs being sold. While crop production fell in 2007-08 because of the effect of the adverse seasonal conditions on yields, higher prices boosted cropping receipts, on average, by 27 per cent. However, receipts from the sale of beef cattle fell by 33 per cent, as weaker prices more than offset the effect of increased turn-off rates.

On average, farm cash costs are estimated to have increased by 2 per cent, reflecting increased outlays on interest payments, fertilisers and handling and marketing. Outlays on fodder fell sharply as producers chose to destock rather than maintain high levels of feed purchases.

2008-09

In 2008-09, slaughter lamb producers' financial performance is forecast to strengthen further, with farm business profits rising to average \$8300 a farm. This is because of the combined effects of higher farm cash incomes and a buildup in the value of trading stocks.

On average, farm cash receipts are forecast to increase by 1 per cent to \$522 700 a farm largely because of increased cropping revenue. Despite weaker prices, higher yields are projected to result in grain production recovering in 2008-09. Consequently, cropping receipts are forecast to increase, on average, by 16 per cent. Reduced turn-off rates for sheep and lambs because of producers commencing rebuilding of sheep numbers is expected to result in sheep and lamb receipts falling, on average, by 3 per cent in 2008-09. However, increased sales of prime lambs in 2008-09 are expected to partially offset the effect of a decline in total lamb sales.

In 2008-09, farm cash costs are forecast to fall by 3 per cent as improved seasonal conditions further reduce purchases of fodder and lower interest rates reduce producers' interest payments. Purchases of livestock are also forecast to fall, on average, by 21 per cent as animal numbers are expected to be rebuilt via reduced turn-off rates rather than through increased purchases.

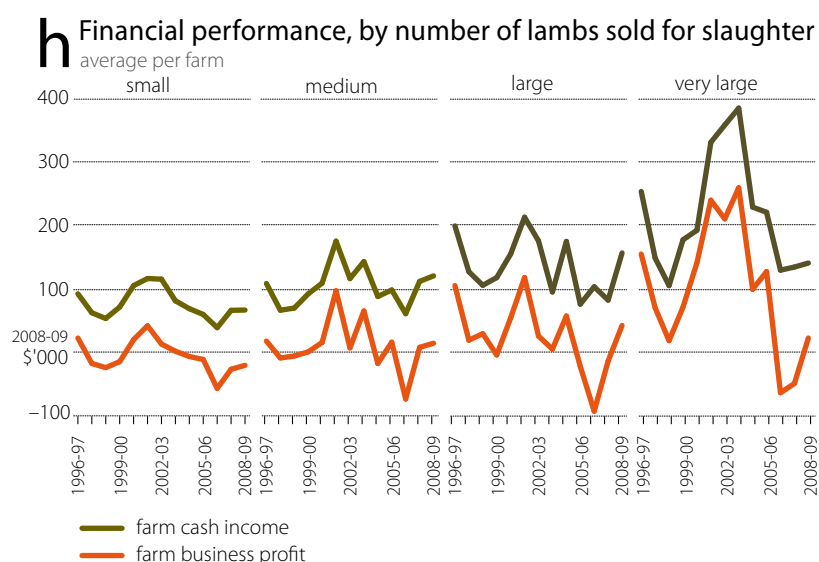
Financial performance by scale of slaughter lamb production

Historically, the financial performance of slaughter lamb producing farms improved with the scale of slaughter lamb production. However, in the three years to 2008-09, this trend is not as apparent because the effects of drought on lamb production, lamb sales and higher grain prices differed between producers of differing scales of slaughter lamb production.

In 2007-08, small and medium scale slaughter lamb producers' incomes were boosted by increased livestock turn-off rates and higher grain and wool prices (tables 4 and 5). In 2007-08 and 2008-09, these producers generated, on average, more than 50 per cent of farm cash receipts from the sale of grain crops despite realising lower yields. The additional cash flows from grain sales appear to have helped many of these producers to limit their destocking of sheep and to sustain farm incomes (figure h).

In contrast, very large scale producers destocked more intensively in 2007-08 and the drought significantly constrained their capacity to finish lambs for sale. Consequently, the number of prime lambs sold fell sharply, while the number of non-prime lambs increased significantly. Also, these producers have smaller cropping enterprises and did not benefit as significantly from the increase in grain prices. The loss of revenue because of fewer lambs being sold as prime lambs, combined with the reduction in the value of farm trading stocks, resulted in these farms realising significant business losses in 2006-07 and 2007-08, after a sustained period of substantial profits.

In 2008-09, farm business profitability of very large scale producers is projected to strengthen, although it is expected to remain at historically low levels as it will take producers several of years to rebuild ewe numbers. In 2008-09, very large slaughter lamb producers are projected to mate 17 per cent fewer ewes than they did in 2006-07 (table 4).



5 Financial performance of slaughter lamb producers, by number of lambs sold for slaughter

average per farm

	small			medium			large			
	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	
Receipts										
Sheep and lambs	\$ 43 188	45 840 (9)	50 600	72 353	86 010 (7)	73 900	140 371	130 130 (3)	132 500	
– adult sheep	\$ 15 913	21 910 (18)	na	17 329	31 970 (17)	na	31 146	29 160 (9)	na	
– lambs	\$ 27 275	23 940 (4)	na	55 024	54 040 (3)	na	109 225	100 980 (3)	na	
– prime lambs	\$ 21 187	15 130 (7)	na	42 485	34 100 (5)	na	84 653	70 540 (7)	na	
– other slaughter lambs	\$ 4 890	7 050 (14)	na	12 063	17 710 (9)	na	23 807	27 100 (16)	na	
– lambs not for slaughter	\$ 1 199	1 760 (32)	na	475	2 230 (46)	na	765	3 350 (46)	na	
Beef cattle	\$ 41 966	19 300 (32)	18 100	31 891	28 420 (19)	33 800	192 898	75 880 (18)	83 200	
Wool	\$ 31 376	52 810 (9)	38 200	57 991	62 100 (9)	51 900	91 160	90 740 (8)	65 000	
Crops	\$ 119 436	146 100 (7)	143 900	138 230	247 400 (17)	291 600	174 096	191 290 (14)	255 700	
Off-farm share farming	\$ 5 590	2 660 (91)	na	3 026	8 630 (35)	na	4 228	7 290 (34)	na	
Off-farm contracts	\$ 4 075	8 890 (43)	8 058	14 445	7 910 (25)	25	5 522	6 890 (24)	6 892	
Total cash receipts	\$ 277 224	303 320 (6)	283 900	356 824	477 670 (10)	494 600	688 264	588 620 (7)	634 700	
Costs										
Beef cattle purchases	\$ 16 319	4 250 (55)	2 300	4 074	6 270 (47)	4 500	92 357	21 130 (34)	13 400	
Contracts	\$ 7 192	10 040 (28)	na	6 118	13 740 (12)	na	13 877	17 420 (18)	na	
Crop and pasture chemicals	\$ 21 279	23 090 (13)	22 600	21 284	30 560 (12)	31 600	35 244	29 250 (16)	32 300	
Fertilisers	\$ 35 924	33 600 (8)	38 500	35 094	59 810 (12)	70 600	54 073	61 560 (9)	67 100	
Fodder	\$ 8 741	5 300 (21)	2 700	11 256	7 490 (19)	4 900	52 814	22 140 (45)	20 100	
Fuel, oil and grease	\$ 19 630	21 410 (6)	21 400	32 118	33 640 (6)	32 400	40 105	34 790 (6)	39 200	
Handling and marketing	\$ 9 616	9 150 (10)	13 500	12 592	11 570 (7)	27 600	15 212	17 790 (7)	26 500	
Hired labour	\$ 5 866	6 220 (32)	5 100	11 325	9 760 (17)	12 100	20 543	15 700 (13)	18 100	
Interest	\$ 24 980	29 140 (29)	16 800	33 214	48 900 (12)	34 200	60 878	57 690 (12)	46 800	
Repairs and maintenance	\$ 19 311	20 640 (9)	19 100	28 343	28 660 (8)	30 200	37 914	45 280 (22)	30 200	
Shearing and crutching	\$ 6 916	9 240 (13)	9 900	12 198	11 760 (10)	13 600	23 328	18 560 (8)	18 700	
Sheep purchases	\$ 6 983	5 900 (21)	5 100	10 211	16 740 (19)	9 500	22 748	22 600 (11)	15 600	
Total cash costs	\$ 240 273	237 400 (11)	221 800	295 860	367 500 (6)	377 200	582 320	512 320 (9)	475 700	
Financial performance										
Farm cash income	\$ 36 951	65 920 (24)	62 100	60 964	110 180 (26)	117 400	105 944	76 300 (42)	159 100	
Farm business profit	\$ -59 114	-25 430 (55)	-27 000	-75 100	6 400 (463)	11 700	-90 549	-16 430 (202)	46 200	
Rate of return										
– excl. capital appreciation	% -1.1	0.3 (102)	-0.2	-0.9	1.7 (45)	1.5	-0.3	1.0 (54)	2.0	
– incl. capital appreciation	% 3.2	3.8 (32)	na	5.9	5.3 (21)	na	5.5	2.0 (43)	na	

Note: Figures in parenthesis are relative standard errors, expressed as a percentage of the estimates.

continued...

5 Financial performance of slaughter lamb producers, by number of lambs sold for slaughter

continued average per farm

	very large			Australia		
	2006–07	2007–08	2008–09	2006–07	2007–08	2008–09
Receipts						
Sheep and lambs	\$ 341 857	354 030 (9)	332 000	107 438	114 480 (4)	110 700
– adult sheep	\$ 39 857	58 050 (14)	na	22 095	31 310 (8)	na
– lambs	\$ 302 000	295 980 (11)	na	85 343	83 170 (5)	na
– prime lambs	\$ 255 325	243 010 (12)	na	68 755	60 600 (6)	na
– other slaughter lambs	\$ 45 625	48 940 (32)	na	15 725	20 040 (11)	na
– lambs not for slaughter	\$ 1 049	4 030 (57)	na	863	2 530 (23)	na
Beef cattle	\$ 156 097	178 250 (29)	156 000	79 928	53 320 (14)	54 300
Wool	\$ 166 327	151 690 (12)	103 200	67 697	75 840 (5)	56 600
Crops	\$ 360 084	304 390 (14)	360 600	165 406	210 560 (8)	245 100
Off-farm share farming	\$ 3 982	7 550 (34)	na	4 298	6 340 (23)	na
Off-farm contracts	\$ 4 171	6 880 (42)	42	7 774	7 880 (19)	28
Total cash receipts	\$ 1 144 937	1 070 760 (9)	1 029 800	485 288	516 650 (4)	522 700
Costs						
Beef cattle purchases	\$ 43 662	64 170 (49)	47 600	29 322	15 630 (27)	11 000
Contracts	\$ 37 785	35 510 (22)	na	11 844	15 930 (10)	na
Crop and pasture chemicals	\$ 52 376	49 920 (16)	52 300	27 657	30 230 (7)	31 400
Fertilisers	\$ 96 972	106 430 (13)	120 500	46 504	57 480 (6)	65 700
Fodder	\$ 77 548	50 500 (52)	18 700	26 045	14 990 (26)	9 100
Fuel, oil and grease	\$ 67 915	62 010 (12)	60 600	33 441	33 410 (4)	33 800
Handling and marketing	\$ 26 272	31 240 (7)	45 700	13 677	14 450 (4)	25 100
Hired labour	\$ 42 045	52 310 (16)	53 300	14 807	14 950 (9)	16 200
Interest	\$ 117 509	127 060 (14)	89 600	45 659	53 820 (8)	38 100
Repairs and maintenance	\$ 77 912	47 100 (7)	51 600	32 927	31 830 (7)	29 300
Shearing and crutching	\$ 42 779	39 150 (10)	34 900	16 070	15 650 (5)	16 200
Sheep purchases	\$ 86 235	64 520 (17)	74 300	20 742	20 240 (9)	17 400
Total cash costs	\$ 1 016 076	934 650 (12)	886 300	416 581	424 420 (5)	410 900
Financial performance						
Farm cash income	\$ 128 861	136 110 (31)	143 500	68 708	92 230 (15)	111 700
Farm business profit	\$ –64 528	–48 440 (91)	25 800	–70 713	–14 900 (97)	8 300
Rate of return						
– excluding capital appreciation %	0.9	1.4 (27)	1.8	–0.3	1.2 (26)	1.3
– including capital appreciation %	4.2	3.4 (26)	na	4.8	3.7 (14)	na

Note: Figures in parenthesis are relative standard errors, expressed as a percentage of the estimates.

Investment in new farm capital

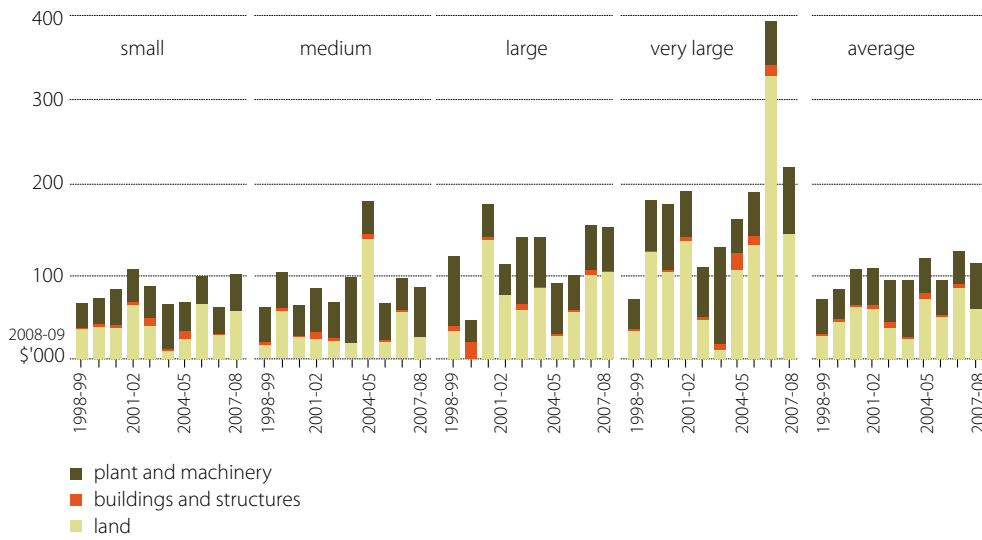
Producers' capacity to increase incomes following the drought will be influenced by their past investments in additional land to expand the scale of their farming activities and in new infrastructure or machinery to boost productivity in the longer term.

Investments undertaken

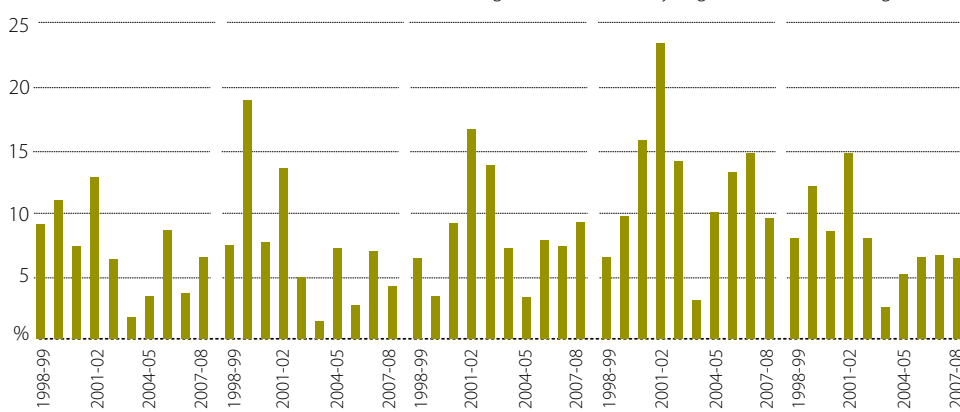
Over the past decade, slaughter lamb producers responded to rising lamb prices and farm incomes by increasing their investments in items such as land, plant and machinery. This resulted in the industry's annual investments in new capital rising from an average of \$89 000 a farm in the five years to 2002-03, to \$106 000 a farm in the five years to 2007-08 (figure i).

However, in recent years, the proportion of slaughter lamb producers who have acquired more land has declined because of the combined effects of rising rural land prices (figures j and k) and drought. Nonetheless, producers of all scales of slaughter lambs have remained active purchasers of land. Between 2004-05 and 2007-08, the proportion of farms acquiring land averaged 5 to 6 per cent of slaughter lamb producers.

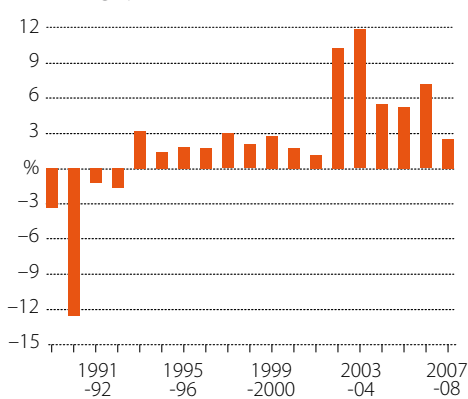
i Composition of farm capital purchases, by number of lambs sold for slaughter
average per farm



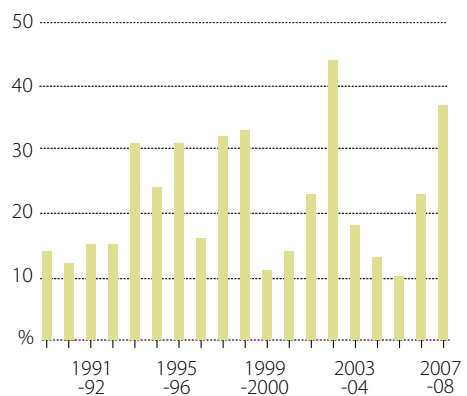
j Proportion of producers purchasing land, by number of lambs sold for slaughter
small medium large very large average



k Change in real land values of slaughter lamb producing farms
average per farm



l Average increase in area operated, by farms acquiring more land



Historically, farms which have acquired additional land increased their farms' area, on average, by 21 per cent (figure l). In 2007-08, around 6.5 per cent of producers acquired more land, resulting in these farms' area operated increasing, on average, by 37 per cent.

To investigate the characteristics of slaughter lamb producers who traded land during the 2000s, farms were allocated into one of three groups based on whether or not the operator had bought or sold land. Slaughter lamb producers who bought land, on average, operated less land but had larger sheep flocks which had a greater focus on slaughter lamb production (table 6). As a consequence, these producers mated more ewes, had higher lambing rates, sold more prime lambs and realised higher average real prices for sheep and lambs. Both land buyers and sellers had substantial farm cash incomes during this period. However, land sellers realised, on average, small business losses, while land purchasers realised modest business profits. Producers buying land increased their debt, on average, by 63 per cent, while land sellers used some of their funds to reduce debt by 14 per cent.

6 Physical and financial characteristics of slaughter lamb industry, 2001-02 to 2007-08

average per farm

		land sellers	no change	land buyers
Physical characteristics				
Area operated, 30 June	ha	3 210	1 912	2 830
Change in area operated	%	-14	0	26
Number of sheep, 30 June	no.	2 193	2 287	3 089
Number of beef cattle, 30 June	no.	180	118	136
Area sown to crops	ha	542	467	782
Number of ewes mated	no.	1 308	1 215	1 599
Lambing rate	%	85	85	88
Total number of lambs sold for slaughter	no.	855	719	1 057
- prime lambs	no.	587	506	831
Average price received for				
Wool	\$/kg	578	579	557
Adult sheep	\$/head	55	54	56
Lambs	\$/head	78	80	85
Prime lambs	\$/head	82	83	86
Farm financial performance				
Farm cash receipts	\$	482 678	394 774	668 271
Farm cash costs	\$	364 456	298 823	533 098
Farm cash income	\$	118 222	95 950	135 173
Farm business profit	\$	-6 699	5 212	25 590
Rate of return excl. capital appreciation	%	1.2	1.4	2.4
Change in farm debt	%	-14	4	63

Financing of investments

Producers have a number of options available to them to fund their new capital purchases, including their farm businesses cash flows, debt facilities, farm liquid assets and off-farm income sources.

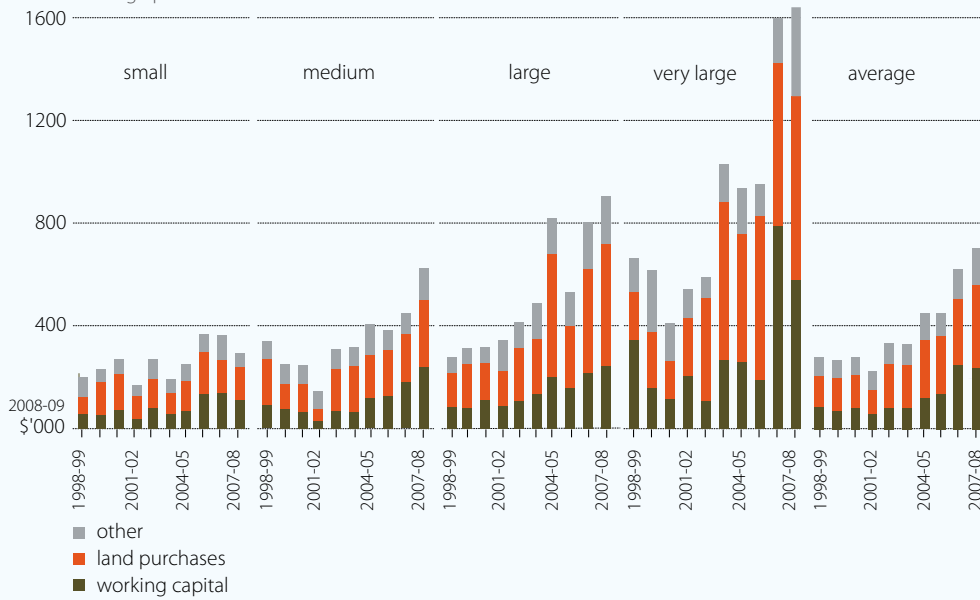
Farm debt

Over the past decade, farm business debt levels have increased substantially, with slaughter lamb producers' debt increasing in real terms from an average of \$281 000 a farm in 1998-99 to almost \$700 000 a farm in 2007-08 (figure m). The strong level of investment in new capital undertaken during this period resulted in debt for land purchases increasing by 160 per cent and other debts by 92 per cent. In addition, working capital debt jumped by almost 180 per cent in the decade to 2007-08, as a number of droughts during this period adversely affected business cash flows and forced many producers to borrow funds to meet the operational requirements of their business.

Reflecting this sharp increase in debt levels, producers' debt servicing costs have increased significantly. In 2007-08, slaughter lamb producers used more than 10 per cent of farm cash receipts to finance their debt interest payments (figure n). In contrast, a decade earlier, producers were required to use just 6.5 per cent of farm cash receipts to service their debt. In 2008-09, lower interest rates and a recovery in farm revenue are expected to result in debt servicing commitments falling significantly.

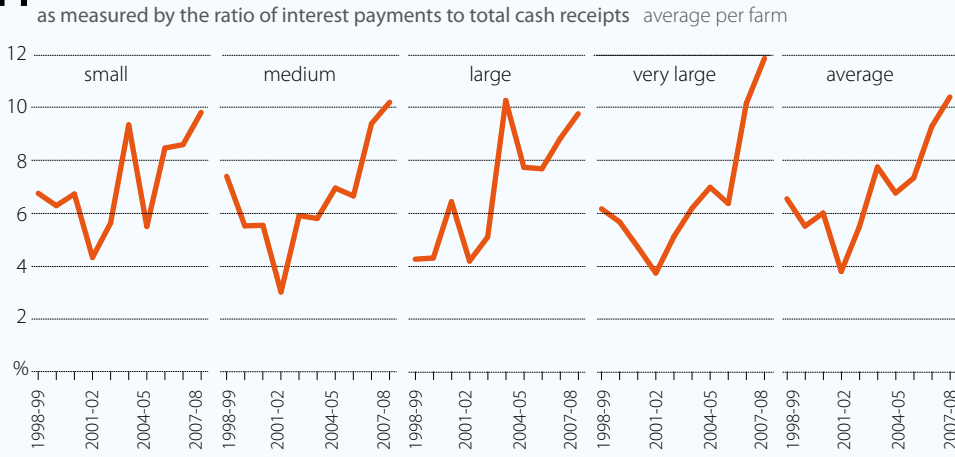
m Farm debt, by number of lambs sold for slaughter

average per farm



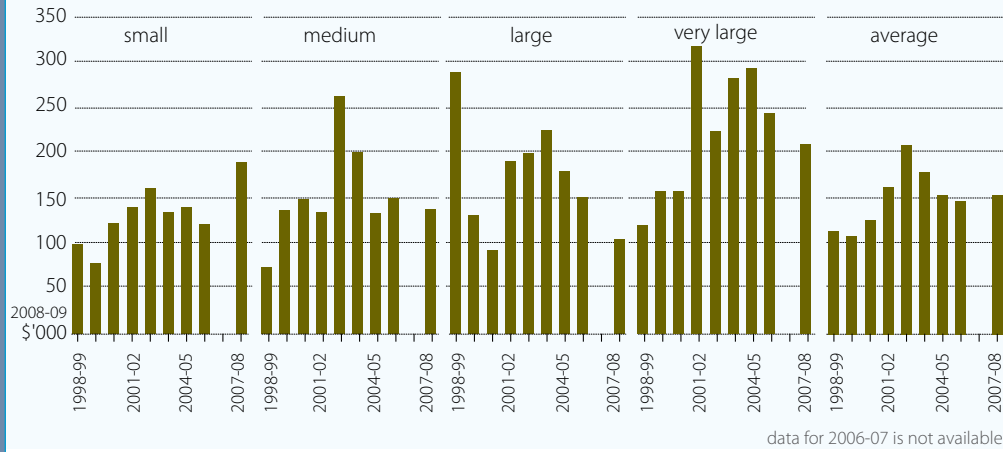
n Debt servicing, by number of lambs sold for slaughter

as measured by the ratio of interest payments to total cash receipts average per farm



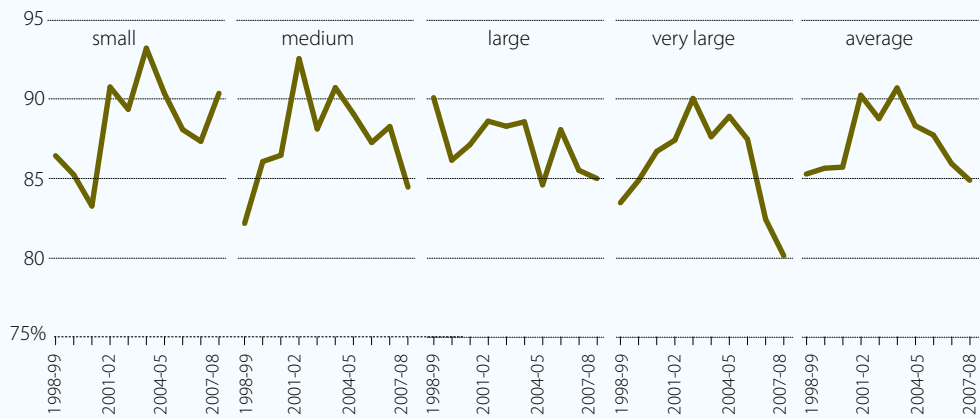
O Liquid assets, by number of lambs sold for slaughter

average per farm



p Equity ratio, by number of lambs sold for slaughter

average per farm



Use of liquid assets

In addition to increasing debt for land purchases and working capital, slaughter lamb producers have been running down their liquid asset reserves in recent years (figure o). Since peaking at \$209 000 a farm in 2002-03, liquid assets declined steadily. In 2007-08, improved farm financial performance and reduced capital purchases are estimated to have enabled many producers to rebuild farm liquid asset reserves.

Implications for farm equity levels

Despite the sharp increase in producers' farm debt in recent years, equity levels remain at historically strong levels (figure p). This is largely because of the strong growth in rural land values which has occurred during this period. However, since peaking at an average equity ratio of 90 per cent in 2003-04, farm equity has been in decline, particularly for very large scale producers.

In coming years, the currently strong equity levels of slaughter lamb producing farms mean that most producers are likely to have little difficulty in sourcing funds for any additional investments or working capital during the post drought flock rebuilding and expansion phase.

The current farm equity levels are dependent on land values remaining high. However, in 2007-08, the rate of increase in the value of slaughter lamb producers' land averaged 2.5 per cent, well below the average annual increase which occurred in the five years to 2006-07 of almost 8 per cent (figure k).

Productivity in the sheep industry

Total factor productivity (TFP) measures outputs relative to total inputs used to produce the output. Productivity growth in Australia's broadacre and dairy industries is highly variable on a year-to-year basis. Between 1977-78 and 2006-07, broadacre producers' productivity growth averaged 1.5 per cent a year, with cropping and mixed livestock-cropping farms recording the highest annual growth in productivity (table 7).

7 Average annual input, output and TFP growth in broadacre and dairy industries 1977-78 to 2006-07

	input growth %	output growth %	TFP growth %
Total broadacre	-0.6	0.8	1.5
Cropping	1	3.1	2.1
Mixed crop-livestock	-1.5	0.1	1.5
Beef	0.1	1.7	1.5
Sheep b	-1.8	-1.4	0.3
Dairy a	3.9	5.1	1.2

a Dairy industry estimates are for the period 1988-89 to 2006-07 as data are not available for earlier years. **b** The sheep industry includes farms mainly engaged in running sheep (ANZIC 141) and those running both sheep and beef cattle (ANZIC 144).

Productivity growth is driven by producers generating the same amount of output with fewer inputs, increasing output with the same amount of inputs or increasing output at a faster rate than inputs. Over the past 30 years, cropping farms in Australia realised the highest annual productivity growth rate among the broadacre industries, averaging 2.1 per cent. This was the result of producers increasing output by 3.1 per cent a year but only increasing inputs by 1 per cent a year.

Between 1988-89 and 2006-07, slaughter lamb producers' productivity growth rate of 0.22 per cent was similar to the sheep industry's average growth rate of 0.3 per cent (tables 7 and 8). However, during this period, slaughter lamb producers increased input use by 2.8 per cent a year to realise a 3 per cent increase in annual production. In contrast, the sheep industry as a whole has been contracting, with a 1.8 per cent fall in inputs resulting in a 1.4 per cent fall in output.

In recent years, productivity growth in the slaughter lamb industry has been affected by a number of years of adverse seasonal conditions, particularly in the drought years of 2002-03 and 2006-07 (figure q). Following the 2002-03

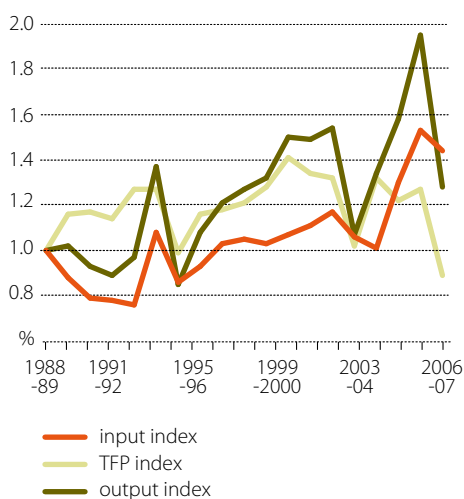
8 Average annual productivity growth in slaughter lamb industry

1988-89 to 2006-07

	TFP growth %	output growth %	input growth %
Total	0.22	2.99	2.77
Scale			
Very large (more than 2000 head)	-0.14	6.99	7.13
Large (1000 to 2000 head)	0.66	4.64	3.98
Medium (500 to 1000 head)	-0.14	2.97	3.11
Small (200 to 500 head)	-0.07	1.13	1.20
Very small (less than 200 head)	0.32	-1.47	-1.80
Intensity			
High (more than 70 per cent)	-0.20	3.92	4.13
Medium (30 to 70 per cent)	0.24	3.78	3.55
Low (less than 30 per cent)	0.24	0.70	0.46

9 Growth in total factor productivity, inputs and output

slaughter lamb industry



drought, increased livestock purchases to rebuild animal numbers, combined with historically high fodder purchases because of continuing dry conditions, resulted in slaughter lamb producers using historically high levels of inputs.

In coming years, productivity growth rates will be affected by two conflicting factors. Firstly, the recent capital investments undertaken to boost farm size and to acquire new plant and machinery are likely to be a positive factor for productivity growth. However, the need to rebuild sheep numbers following the 2006-07 and 2007-08 droughts is likely to depress productivity growth temporarily as producers increase purchases of inputs.

Survey methodology and definitions

Target population

ABARE surveys are designed and samples selected on the basis of a framework drawn from the Business Register maintained by the

Australian Bureau of Statistics (ABS). This framework includes agricultural establishments in each statistical local area classified by size and major industry. The estimates published in this report cover establishments with an estimated value of agricultural operations of \$40 000 or more. A definition of the estimated value of agricultural operations is given in Australian Standard Industrial Classification (ABS 1983, cat. no. 1201.0).

Survey design and sample weighting

The population was stratified by operation size using the estimated value of agricultural operation (EVAO). The size of each stratum was determined using the Dalenius-Hodges method. The sample allocation to each stratum was done using a mixture of the Neyman allocation, which takes into account variability within strata of the auxiliary variable, in this case EVAO, and proportional allocation, which only considers the population number in each stratum. The Neyman allocation allocates large proportions of sample to strata with large variability, in the case of this survey, strata of larger farms.

The estimates presented in this report are calculated by appropriately weighting the data collected from each sample farm and then using the weighted data to calculate population estimates. Generally, larger farms have smaller weights and smaller farms have larger weights, reflecting the strategy of sampling a higher fraction of larger farms than of smaller farms (the former having a wider range of variability of key characteristics).

Reliability of estimates

The reliability of the estimates of population characteristics presented in this report depends on the design of the sample and the accuracy of the measurement of characteristics for the individual sample farms.

Sampling errors

Only a small number of farms out of the total number of farms in a particular industry are surveyed. The data collected from each sample farm are weighted to calculate population estimates. Estimates derived from these farms are likely to be different from those that would have been obtained if information had been collected from a census of all farms. Any such differences are called 'sampling errors'.

The size of the sampling error is most influenced by the survey design and the estimation procedures, as well as the sample size and the variability of farms in the population. The larger the sample size, the lower the sampling error is likely to be. Hence, national estimates are likely to have smaller sampling errors than industry and state estimates.

To give a guide to the reliability of the survey estimates, sampling errors have been calculated for all estimates in this report. These estimated errors, expressed as percentages of the survey estimates and termed 'relative standard errors', are given next to each estimate in parentheses.

Calculating confidence intervals using relative standard errors

Relative standard errors (RSE) can be used to calculate 'confidence intervals' that give an indication of how close the actual population value is likely to be to the survey estimate.

To obtain the standard error, multiply the relative standard error by the survey estimate and divide by 100. For example, if average total cash receipts are estimated to be \$100 000 with a relative standard error of 6 per cent, the standard error for this estimate is \$6000. This is one standard error. Two standard errors equal \$12 000.

For a 66 per cent confidence interval, there is roughly a two in three chance that the 'census value' (the value that would have been obtained if all farms in the target population had been surveyed) is within one standard error of the survey estimate. This range of one standard error is described as the 66 per cent confidence interval. In this example, there is an approximately two in three chance that the census value is between \$94 000 and \$106 000 (\$100 000 plus or minus \$6000).

For a 95 per cent confidence interval, there is roughly a 19 in 20 chance that the census value is within two standard errors of the survey estimate (the 95 per cent confidence interval). In this example, there is an approximately 19 in 20 chance that the census value lies between \$88 000 and \$112 000 (\$100 000 plus or minus \$12 000).

The size of the RSE is mainly influenced by the design of the survey, the sample size and the variability in the population. For example, the larger the sample size, the lower the RSE is likely to be.

Comparing estimates

When comparing estimates between two groups, it is important to recognise that the differences are subject to sampling error. As a rough rule of thumb, a conservative estimate (an overestimate) of the standard error of the difference can be constructed by adding the squares of the estimated standard errors of the component estimates and taking the square root of the result.

For example, suppose the estimates of farm cash income are \$59 334 for small scale slaughter lamb producers and \$51 664 for medium scale slaughter lamb producers, with the relative standard errors given as 38 and 42 per cent respectively. The difference between these two estimates is \$7670. The standard error of the difference can be estimated as:

$$\sqrt{((38 \times \$59\,334 / 100)^2 + (42 \times \$51\,664 / 100)^2)} = \$31\,292$$

A 95 per cent confidence interval for the difference is:

$$\$7670 \pm 1.96 \times \$31\,292 = (-\$53\,662, \$69\,002)$$

Hence, if 100 different samples are taken, in 95 of them, the difference between these two estimates is between -\$53 662 and \$69 002. Also, since zero is in this confidence interval, it is possible to say that the difference between the estimates is not statistically significantly different from zero at the 95 per cent confidence level.

Definition of terms

Owner manager: The primary decision-maker for the business. This person is identified by discussion between interviewer and interviewee as (one of) the key decision-maker(s). This person is usually responsible for the day-to-day operation of the business and may own or have a share in the business.

Area of land at business premises: Includes all land operated by the business, whether owned or rented by the business.

Labour: Measured in work-weeks, as estimated by the owner manager. It includes all work on the business by the owner manager, partners, family, hired permanent and casual workers, but excludes work done by contractors.

Hired labour: Excludes the owner manager, partners and family labour, and work undertaken by contractors. Expenditure on contract services appears as a cash cost.

Capital: The value of capital employed by the business is the market value of all the assets used including leased items but excluding machinery and equipment either hired or used by contractors. Market valuations were provided by the owner manager of surveyed businesses and included the market value of land and fixed improvements used by the business, excluding the value of the owner manager's house. The house value deducted from the total value of land and fixed improvements was the present day replacement cost, depreciated for age.

Gross margin: The cash surplus generated from the production of a commodity. It is calculated as the difference between the average price received and the unit production cash costs.

Debt: Estimated as business debt. It includes all debts attributable to the business excluding personal debt and underwritten loans. Information collected at the survey interview was supplemented by information in the business accounts.

Total cash receipts: Total of revenues received by the business during the financial year, including revenues from the sale of crops, livestock and livestock products. It includes revenue received from royalties, rebates, refunds, plant hire, contracts, insurance claims and compensation, and government assistance payments.

Total cash costs: Payments made by the business for materials and services and for permanent and casual hired labour (excluding partner and other family labour). It includes the value of any lease payments on capital, produce purchased for resale, rent, interest, cropping and livestock related purchases. Capital and household expenditures are excluded from total cash costs. Handling and marketing expenses include commissions, levies etc. for business produce sold. Administration costs include accountancy fees, banking and legal expenses, postage, stationery, subscriptions and telephone. Other cash costs include relatively small cost items like stores, advisory services and travelling expenses.

Depreciation: Estimated by applying the diminishing value depreciation method to the market value of capital items at 30 June 2006. Capital items are categorised into several groups and relevant depreciation rates are applied. The capital groups include vehicles; handling, harvesting and packing equipment; cultivation and sowing equipment; computers, electronic and communications equipment; other plant and equipment; and buildings on the business premises.

Imputed labour cost: Payments for owner manager and family labour may bear little relationship to the actual work input. An estimate of the labour input of the owner manager, partners and their families is calculated in work-weeks and a value is imputed at the relevant Federal Pastoral Industry Award rates.

Farm business profit: Cash operating surplus plus buildup in trading stocks, less depreciation, less the imputed value of the owner manager, partner(s) and family labour.

Profit at full equity: Return to capital and management plus interest, rent and finance lease payments. It is the return produced by all the resources used in the business.

Rate of return: The return to all capital used. It is computed by expressing farm business profit as a percentage of the total opening capital of the business.

Equity ratio: Calculated as a percentage of owned capital at 30 June.

Off-farm income: Income not derived from the surveyed farm business. It includes all off-farm income from wages and salaries, other businesses, other investments and Australian Government social support payments. It is estimated for the owner manager and spouse only.





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