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Producer Research Support

Maximising Profitability of Lamb Finishing Systems

Frances Lamb Group

Frances Lamb Group undertook a project to look at opportunities to maximise the growth rate and profitability of lot feeding lambs, by developing best practice feeding and management strategies to optimise nutrition and health.

The results showed that to reach 23 kilograms carcase weight was readily achievable and efficient in terms of feed conversion and cost of production, but to achieve 24 kilograms carcase weight was a more costly exercise.

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The project

Frances Lamb Group formed because of a common interest in enhancing the efficiency and profitability of on farm lamb finishing systems; by optimising use of genetic improvements, nutrition, and health of lambs fed least cost rations. The group was also keen to investigate marketing options to establish reliable and profitable future contracts.

Group members were concerned about the number of unexplained lamb deaths that occur while lambs are lot fed. It was proposed that some deaths may have been due to dietary vitamin and/or mineral deficiencies, or store animals that had come from deficient areas.

When followed through the abattoir, health problems such as pneumonia (leading to pleurisy), broken ribs and swelling of the joints in the lower leg were observed in lot fed lambs. This resulted in excess trimming and a subsequent lower hot carcase weight, which was paid at a lower price per kilogram.

Frances Lamb Group members identified the main areas believed to be important to the efficiency and profitability of lot feeding enterprises:

- stock health (management and nutrition implications);
- feed quality (availability of essential nutrients, minerals and vitamins in the diet);
- feed conversion efficiency; and
- growth rates (genetics, nutrition and management).

Objectives

1. maximise the growth rate and profitability of lot feeding lambs, by developing best practice feeding and management strategies for optimum nutrition and health:
   a) develop nutritionally balanced least cost rations for each feedlot, based on the feeds available on the property;
   b) increase group awareness of nutrition and management practices that will improve the health and growth rates of feedlot lambs;
   c) reduce the incidence of trimming carcases (due to health problems) from five percent to one percent;
   d) develop least cost mineral mix;
   e) reduce the time lambs spend in the feedlot by increasing growth rate to 350 grams per day;
   f) increase carcase weights to over 24 kilograms, while reducing the amount of fat on the carcase and maximising meat yield;
   g) ensure all group members are able to calculate the gross margin of their feedlot enterprise. Enable producers to compare the economics of their own system to other feedlot and irrigation finishing systems, thereby developing district benchmarks;
   h) develop alliances with producers of store lambs, that have superior genetics, and known health status; and
   i) build alliances with processors, by increasing the group's reputation for quality and ability to meet market specifications.
2. evaluate the ability of different breeds of sheep to meet market specifications for weight, fat depth and carcase yield.

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Key points

- The results showed that to reach 23 kilograms carcase weight was readily achievable and efficient in terms of feed conversion and cost of production, but to achieve 24 kilograms carcase weight was a more costly exercise.
- Increasing growth rates and turning lambs off in six weeks (42 days on feed) resulted in significantly improved gross margins.

What was done

In February 2000, the group collected feed samples from nine different feedlots. The samples were analysed by FEEDTEST and the State Chemistry Laboratory. The following month, the group went through the results and worked out how to use them to calculate a balanced ration and how to calculate the cost of production for a grain finishing enterprise.

In May 2000, three consignments of lambs from different properties were followed through two different abattoirs.

By November that year, group members decided which trials they wished to run on each property.

A couple of months later, the group attended a presentation on nutritional requirements, feedlot guidelines and common feedlot health problems, then invited one of the abattoirs to make a presentation on contract and alliance opportunities for feedlot producers. These activities were followed by attendance at the South Australia Lamb Forum (held in Naracoorte). Presentations were given on marketing, VIAscan and lamb finishing systems (nutrition, genetics and economics).

Three Frances Lamb Group trials were set up at the start of 2001. Cost of production was analysed and recorded for all trials. Two hundred lambs were individually tagged and VIAscan details about the breed, sex and diet of individual lambs obtained.

In April, the lambs were weighed and condition scored. In May, lambs from one trial were killed and followed through the abattoir individually. No blood testing was done because it was too expensive.

The lambs in four feedlots (ten lambs per feedlot) were blood sampled in June. Preliminary results showed that vitamin E levels and manganese reserves in the liver were marginal and in one feedlot the lambs had depleted their vitamin A reserves in the liver. Lambs which had been fed on silage and lucerne hay (which had higher levels of beta-carotene – as indicated from the feed tests) had adequate levels of vitamin A. The livers of these lambs were collected at slaughter and sent to the South Australian Research and Development Institute (SARDI) for biochemical analysis.

The results were collected and presented at a group forum in August. The group decided not to spend further effort on blood testing next season as originally planned, but to carry out best practice procedures on entry into feedlot, and reduce the time lambs spend in feedlots. This was intended to reduce the chance of deficiencies occurring.

Several Frances Lamb Group members also participated in an EDGEnetwork workshop; "Effective Breeding Decisions", in September.

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MLA also recommends

Sheep Genetics Australia

Sheep Genetics Australia (SGA) is the national genetic evaluation service for the Australian sheep industry. It is built around the world's most comprehensive sheep genetics database, and will deliver genetic information on a fee-for-service basis.

Tel 02 6773 2493 or
www.sheepgentics.org.au

EDGEnetwork

EDGEnetwork offers practical field-based workshops to improve productivity and profitability for the long-term.

Workshops cover breeding, nutrition, grazing management, marketing and selling.

Call MLA on 1800 993 343 or
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What happened?
Trial 1

In the first feedlot trial, High-Pro sheep pellets were tested against a mixed grain/hay ration.

Analysis of the gross margins of sheep that were kept on pellet rations for 25 and 53 days are shown in *Tables 1.* and *2.* respectively.

These results demonstrate that an extra margin of $17.39 per head could have been achieved if the lambs were sold earlier.

Table 1. Pellet Ration (25 days)

Production Data	Averages
Number of animals	100.00
Starting live weight	47.70
Finishing Live weight	51.70
Number of days on feed	25.00
Feed eaten (kg/head/day)	2.00
Growth rate	0.16
Feed conversion ratio	0.08

Feed Costs	$/head
Feed costs	11.00

Variable Costs	$/head
Lice treatment	
Drench treatment	0.12
Vaccination (5 in 1)	0.93
Mineral supplements and buffer	0.25
Fuel, oil and repairs	0.25
Labour	0.25
Freight of stock store	1.70
Freight of finished stock	2.00
Slaughter levy	0.71
Yard fees	0.20
Commission	0.00
Other costs	

Prices	$/head	c/kg
Store animals	35.20	1.80
Finished animals	71.35	3.00
Skin value	10.00	

Gross Margin Budget	$/head
Gross income	81.35
Less feed costs	11.00
Less variable costs	6.41
Less cost of initial animals	35.20
Total costs	52.61
Gross margin per head	**28.73**

Table 2. Pellet Ration (53 days)

Production Data	Averages
Number of animals	100.00
Starting live weight	47.70
Finishing Live weight	50.50
Number of days on feed	53.00
Feed eaten (kg/head/day)	2.23
Growth rate	0.05
Feed conversion ratio	0.02

Feed Costs	$/head
Feed costs	26.00

Variable Costs	$/head
Lice treatment	
Drench treatment	0.12
Vaccination (5 in 1)	0.93
Mineral supplements and buffer	0.25
Fuel, oil and repairs	0.53
Labour	0.90
Freight of stock store	1.70
Freight of finished stock	2.00
Slaughter levy	0.71
Yard fees	0.20
Commission	0.00
Other costs	

Prices	$/head	c/kg
Store animals	35.20	1.80
Finished animals	67.88	2.80
Skin value	12.00	

Gross Margin Budget	$/head
Gross income	79.88
Less feed costs	26.00
Less variable costs	7.34
Less cost of initial animals	35.20
Total costs	68.55
Gross margin per head	**11.34**

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Trial 2

The second trial considered high stocking rates and pen sizes against low, the use of silage against mixed ration, and the source of lambs.

Silage versus grain

Lambs fed on silage ate 2.69 kilograms per head, compared with lambs on the grain ration that only ate 2.09 kilograms of feed per head. The increased feed volume increased feed costs by $2.80 per head.

Lambs fed on silage grew 200 grams per day, while lambs fed on grain only grew 190 grams per day.

Bought lambs versus enterprise bred lambs

Wool return from bought lambs ($7.20 if bought on known property sale, $3.32 if bought at saleyards) was higher than enterprise bred lambs ($4.70), which compensated for the fact that they ate more and grew more slowly. This analysis included shearing cost of $3.20 per head.

High versus low stocking rate

No differences were found in growth rates, but lambs stocked at five metres squared (the lower stocking rate) ate 1.1 kilograms less feed per head per day. This worked out to a feed cost difference of $20 per head, and meant that the gross margins were around $11 per head, compared with a gross margin of under $1 per head for the low stocking rate lambs (24 metres squared). The lower stocking rate paddock also had a cattle feeder in the paddock, so the differences could have been a result of the different type of feeder, rather than the stocking rate.

Bought lambs - high (49 kilograms) versus low (40 kilograms) entry weight

Lambs that entered the feedlot at low weights grew faster (150 grams per day) than lambs that entered at high weights, and gained an extra 3.3 kilograms in the same time period. Low entry weight lambs gained 12.3 kilograms in 82 days, compared to heavy weight lambs that only gained nine kilograms in the same time period.

Lambs that entered the feedlot at high weights ate more and feed costs were higher.

Despite the heavy entry weight lambs finishing five kilograms heavier than the light entry lambs and making $84 per head compared to $77 per head, the gross margins for the heavy entry weight lambs was lower. Heavy weight entry lambs earned $3.84 gross margin per head, whilst the light weight entry lambs earned $8.36 gross margin per head.

Trial 3

This trial tested the performance of sheep that received a vitamin A, D & E vaccination against a control group and compared the growth rates with high and low stocking rates. The results of this trial are summarised in *Table 3. Trial 3 Results*.

There was no significant difference between animals treated with the vitamin vaccination and the control lambs.

Lambs were not slaughtered until day 68. In Pen 3, growth rates slowed in the second period (day 35 to day 68) to 180 grams per day. The overall growth rate was therefore 275 grams per day.

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Table 3. Trial 3 Results

Pen	No.	St. Rate	Lwt (1)	Lwt (35)	Grain	Hay	Total	ADG (35d)	FCR
1	266	4.5	43.9	53.7	1.4	0.5	1.9	280	6.5:1
2	336	3.6	40.0	51.9	1.4	0.5	1.9	340	5.5:1
3	210	5.7	37.0	49.8	1.3	0.5	1.9	366	5.0:1
4	205	5.9	37.0	48.8	1.3	0.5	1.8	337	5.5:1
5	368	3.3	34.0	45.2	1.0	0.5	1.6	320	4.7:1

The majority of these lambs weren't slaughtered until day 82 and overall growth rates during this period were 220 grams per day.

No differences in growth rate were seen between the stocking rate of 24 metres squared and 5.9 metres squared, but differences in amount of feed eaten when more trough space was supplied were evident.

Discussion

The results showed that to reach 23 kilograms carcase weight was readily achievable and efficient in terms of feed conversion and cost of production, but to achieve 24 kilograms carcase weight was a more costly exercise.

In one of the trials lambs grew at 310 grams per day during the first 57 days, but averaged over 82 days, the growth rate was only 220 grams per day (which meant that growth rate was slower in the second period). Lambs that entered the feedlot at lighter weights (37 to 40 kilograms) grew at a faster rate than lambs that entered at heavier weights (45 kilograms and over).

One of the reasons for a slower growth rate of heavier entry weight lambs and of lambs in the final period, was that lambs had already reached their mature weight. Lambs are only able to grow as large as their genetic potential allows, and after this will start to lay down fat. Larger lambs also eat a greater quantity of feed. A small increase in carcase weight can be achieved due to an increase in dressing percentage, however the cost of production to achieve this makes it inefficient. In one trial, growth rates in the final 28 days pre-slaughter were so low that lambs only put on an extra 2.7 kilograms of live weight (1.2 kilograms carcase weight). It cost an extra $6.66 in feed to gain $3.66 for the extra carcase weight.

Increasing growth rates and turning lambs off in six weeks (42 days on feed) also resulted in significantly improved gross margins.

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