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Feeding lambs for out of season production

By R.J. Suiter and K.P. Croker*

During the late summer-autumn of 1977/78 and 1978/79 five to six month old Merino wether weaners were fed mixtures of oat and sweet lupin grain ad lib while grazing on dry pasture. Adding lupin grain to the supplement increased the rate of growth and so decreased the length of time required to reach the slaughter weight but responses to more than 50 per cent lupins in the supplement were not significant.

Net financial margins were largest for the 100 per cent oat treatment ($9.38) and least for the 100 per cent lupin treatment ($7.67).

The expanding sheep meat markets of the Middle East prefer fresh and chilled meats to frozen meat. To meet these preferences a year round supply of sheep suitable for slaughter is required.

There are heavy demands at abattoirs for killing space during September, October and November in most years and occasionally this has delayed slaughter of sheep, with consequent losses in their market suitability. These demands on killing space will increase as the production of lamb increases.

Therefore, spreading the production of lamb over a longer period would help to supply meat for fresh and chilled markets over a greater part of the year and also would help decrease the demand for killing space during busy months.

Supplementation of lambs with cereal grain to stimulate their growth has generally been regarded as uneconomic. However, if the protein content of the cereal grain has been limiting for growth of lambs, other feeds with a higher content of protein may improve the rate of growth. This could increase the chance of obtaining a profitable return from out of season lamb production.

Rations of varying proportions of oat and sweet lupin grains were evaluated in a pilot trial with lambs near Albany, during the summer of 1975/76. Unfinished lambs were fed under normal grazing conditions. The results indicated that as the proportion of lupin to oat grain increased, efficiency of grain conversion, liveweight gain and the proportion of lambs achieving a desired market standard (export grade Red 2, liveweight of about 33 to 34 kg) all increased.

To further investigate the suitability of using lupin/oat diets with lambs, two experiments were carried out at the Department of Agriculture's Newdegate Research Station, the first starting in early January of 1978 and the second in early January 1979. In both years pasture on the trial site was based on subterranean clover, with capeweed, barley grass and erodium the main invading species.

Sheep and management

The lightest third of a flock of medium wool Merino wether weaners born on Newdegate Research Station during July-August 1977 and 1978 were selected for the trials.

In both years a random sample of weaners was taken for pre-trial assessment of carcase weight and grade. This was to provide a measure of the change at the finish of feeding. The weaners in the second year received cobalt and selenium bullets whilst all weaners were drenched monthly with a broad spectrum anthelmintic.

Supplementary feeding

In the first experiment, begun in January 1978, West oats and Uniharvest lupin grain was fed ad lib in the required proportions from self feeders after gradual introduction to the grain over a six day period. The supplements used were:
- 100 per cent oat grain
- 75/25 oat/lupin grain
- 50/50 oat/lupin grain
- 25/75 oat/lupin grain
- 100 per cent lupin grain

Because of a suspicion of grain poisoning with the six day introductory period in the 1978 experiment, a 12 day introductory period was allowed in the 1979 experiment followed by ad lib feeding from self feeders.

Two new treatments were added in 1979 to those used in 1978. These were a 100 per cent lupin supplement without introduction, and a treatment starting on 100 per cent lupins and changing in 25 per cent steps every fourth day to 100 per cent oats. It
was hoped that the lupins might overcome problems of grain poisoning, and simplify the introduction of supplementary feed.

Control groups of weaners grazing dry pasture without supplementation, except when needed for survival, were used in both years to demonstrate the normal summer liveweight patterns of this type of weaner. The stocking rate used in 1978 was seven weaners per hectare and maintenance feeding of the weaners in the control treatment of 200 grams per day of 50/50 oat-lupin grain was necessary to prevent deaths. In 1979 the weaners were stocked at six per hectare and the controls required no maintenance feeding.

In both years the weaners were slaughtered when they had achieved a desirable standard of finish (mean group liveweight in 1978 of 34 kg and in 1979 of 33 kg). Weaners in the unsupplemented control groups were removed from the experiments following the break of season.

Results

The differences in weaner performance between the treatments were similar in the two experiments. The results are summarised in Table 1 and Figure 1. The time to achieve the desired finished liveweight of 34 kg is the important measure in these results as that time determines the total quantity of feed consumed and thus the feeding cost.

As the proportion of lupin grain in the diet increased, so did the rate of growth of the weaners increase. Consequently those weaners on rations containing higher proportions of lupin grain achieved the desired standard of finish faster than did weaners on lower proportions of lupin grain. Little difference could be seen between weaners on 50 per cent or more lupin grain in the supplement.

Total grain used per weaner was similar in all treatments except 75/25 oat-lupins in which the weaners actively sorted the grain in favour of lupins thus leaving waste oat grain on the ground around the feeder. This wastage was about 6 kg per weaner which reduced the grain used

| Table 1. Oat — lupin feeding of Merino weaners for out-of-season lamb production — Newdegate |
| Proportions oat/lupin grain | 100/0 | 75/25 | 50/50 | 25/75 | 0/100 |
| Days to achieve 34 kg | 103 | 91 | 86 | 81 | 79 |
| Growth rate (grams/day) | 107 | 133 | 146 | 152 | 159 |
| Grain consumption (g/d) | 561 | 696 | 710 | 733 | 746 |
| Total grain eaten (kg) | 58 | 64 | 61 | 59 | 59 |
| Grain Conversion Ratio | 5.3:1 | 5.8:1 | 5.5:1 | 5.4:1 | 5.4:1 |
| Net Margins | $9.38 | 8.85 | 7.88 | 7.55 | 7.67 |

Fig. 1 — Average liveweights of Merino wether weaners fed varying proportions of oat and lupin grain.
from 64 kg to 58 kg grain consumed per weaner. This was similar to other treatments. Net financial margins were calculated on grain used rather than grain eaten as the waste grain was a cost against that treatment.

In the second year the two additional treatments, no introduction to ad lib lupin grain and transitional introduction from ad lib lupin grain to ad lib oat grain, resulted in better early growth but this did not persist. By the time the desired finish was reached, performances of the weaners which had no introductory period were similar to the performance of the weaners on the 100 per cent lupin grain with 12 day introduction and the 100 per cent oat grain with 12 day introduction respectively.

However both of these additional treatments suggest that labour requirements for introductory programmes may be reduced. This could improve the profitability of an out-of-season lamb production system.

The weaners achieving the desired market standard produced 76 per cent Red, 11 per cent Blue and 13 per cent White carcasses whilst the sample of weaners slaughtered before feeding began showed that, at that time, the

weaners were below standard and unsuitable for slaughter.

Figure 2 shows an economic analysis of the results. Labour and opportunity cost has not been included as they are determined by the individual situation of each farmer.

In the analysis, oat supplementation had the largest net margin. However, these calculations depend on market prices and costs, and the price of the grain. Midland auction lamb (including skins) prices for 1979 were used and prices for oats of $65 a tonne, and $130 a tonne for lupins. Transport costs to sale of $1.20 a head are assumed, 19 cents a head for anthelmintic and vaccine costs, and saleyard fees and commission costs have been included.

Differences between the net margins of the supplements are reduced when the more logical approach of assuming a common finishing date (April 18) instead of a common starting date (January 11) for all treatments is taken. Even in this case the oat supplement is clearly the most economical.

An important consideration is that the oats used in these experiments had a higher crude protein content than is usual in Western Australian oats.

If the crude protein content of the oats is less than 12 per cent, weaner growth will be markedly depressed. Crude protein content in the range 12 to 14 per cent may depress weaner growth depending on protein availability in the pasture. Reducing the net margin by 53 cents to $8.85 a head by including 25 per cent lupin grain in the supplement would seem to be worthwhile insurance against such a possibility.

Analysis of oat grain sample for crude protein content can be arranged through commercial analytical laboratories which are listed under "Analysts" in the yellow pages of the telephone directory, through the Ruminant Feedstuffs Laboratory of the Department of Agriculture at Bunbury, or through the Government Chemical Laboratories in Perth.

A more detailed presentation of results of this work is available in Department of Agriculture Technical Bulletin No. 51.

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