ADVANTAGE FEEDERS

CREEP FEEDING EXPERIMENT

Six different creep feeds. Which one performs the best?

- Outputs used the average of the five creep fed groups except for the lambs per feed input which was increased to the commercial application of 200 lambs per feeder.
- The outputs used the calculator from www.advantagefeeders.com.au/calculating-return-on-investment
- The outputs includes the costs associated with filling, monitoring and depreciation.

Background:

Butyric acid is made from high starch feeds and is vital for rumen development. When deciding whether and what to creep feed, farmers find themselves asking:

- Which type of feed will result in the highest growth rates?
- Does the percentage of starch in a feed lead to higher growth rates?
- Which feed type will be most profitable based on a range of lamb prices?
- Which feed type will be most profitable based on a range of feed prices?
- Which type of feed flows best and requires the least feeder maintenance?

The objective of the experiment is to provide insight to these questions.

* www.teagasc.ie/animals/beef/calf-rearing/#rumen

METHOD

Age of lambs at commencement: 15 days (average)

Duration: 76 days

Ewes per group: 55 (51 twins and 4 triplets)

Pasture type: 41 days of ryegrass and clover pasture, then 35 days of canola forage*

Mineral supplement: Ad-lib mix of equal parts salt, lime and causmag

Maternal supplement: 12kg per ewe of whole wheat for the first 24 days after lamb marking (500g per day)

Training lambs to creep feed: Ewes were fed from a feeder that was placed next to the creep feeders

Target feeding quantity: 200g per lamb per day**

Location: Burrumbeet, Victoria, Australia

Breed ***	Terminal Breed	Feed Type
Composite	Composite	Reid Stockfeeds cracked grain mix
Composite	Composite	Ridley cracked grain mix
Composite	Composite	Ridley lamb pellet & whole wheat (50:50)
Composite	Composite	Control group - no additional supplement
Merino x Composite	Composite	Whole wheat
Merino x Composite	Composite	Cracked wheat
Merino x Composite	Composite	Cracked wheat & high protein pellet (80:20)****
Merino x Composite	Composite	Control group - no additional supplement

* Every effort was made to ensure the feed on offer was the same for each group however, some slight variations may have existed between the groups.

** Feed consumption monitored every 7 days. When average daily intake reached 200g per lamb per day, feeders were adjusted to limit intake to meet target ration.

*** The feed results of groups that have different maternal breeds needs to be acknowledged when making comparisons.

**** High protein pellet contains 30% protein.

EXPERIMENT SUPPORTERS

Phil Stowe
Learmonth Farmer

Cracked the grain used in the experiment

RIDLEY

REID STOCKFEEDS
The Professional Approach to Feeding.

Supplied feed for three of the groups

Jess Revell

Rumenate Livestock Services

Formulated the cracked grain rations

FINDINGS

TABLE 1.0

Group	Cracked Wheat	Whole Wheat	Reid Cracked Grain Mix	Ridley Cracked Grain Mix	Ridley Pellets & Whole Wheat (50:50)	Cracked Wheat & High Protein Pellet* (80:20)
Starch content**	75%	75%	43%	43%	60%	60%
Protein content**	14%	14%	18%	18%	15%	18%
% of grains cracked	100%	0%	100%	100%	40%	100%
Cost of feed per tonne delivered	$350	$320	$550	$465	$390	$390
Avg. daily intake over 76 days (g/lamb/day)	197	286	152	173	220	216
Avg. cost of feed per lamb	$5.24	$6.95	$6.36	$6.11	$6.52	$6.39
Avg. daily weight gain over control group (g/day)	**55**	**55**	**59**	**44**	**56**	-
Feed conversion***	**3.6 : 1**	**6.0 : 1**	**2.6 : 1**	**3.9 : 1**	**3.9 : 1**	-
Avg. gain in value over control group @$4.00/KgLW	$16.82	$16.61	$17.82	$13.40	$16.88	-
Net profit per lamb****	**$11.58**	**$9.66**	**$11.46**	**$7.22**	**$10.36**	**-**
Lambs per ewe in each group*****	**1.55**	**1.69**	**1.53**	**1.72**	**1.70**	**-**
Lambs per ewe above control group	-0.22	-0.08	-0.08	0.11	0.09	
Net profit per ewe	**$17.91**	**$16.37**	**$17.58**	**$12.58**	**$17.59**	**-**
Maternal breed	Merino x Composite	Merino x Composite	Composite	Composite	Composite	Merino x Composite
Terminal breed	Composite	Composite	Composite	Composite	Composite	Composite

* The high protein pellets became mouldy as a result of wet and humid weather. The lambs became ill and their growth was affected.

** Percentage is the component of the feed rations dry matter.

*** Feed conversion: Kilograms fed to achieve 1kg of liveweight gain.

**** Note: This does not include filling, monitoring or depreciation costs.

***** Average lambs per ewe in the Composite control group was 1.61. Average lambs per ewe in the Merino x Composite group was 1.77.

IMPACT OF FLUCTUATING PRICES

Changes based on a variation to the lamb price ($AUD)

TABLE 1.1

Group	Cracked Wheat	Whole Wheat	Reid Cracked Grain Mix	Ridley Cracked Grain Mix	Ridley Pellets & Whole Wheat (50:50)
Net profit/lamb @$3.00/kgLW	**$7.37**	**$5.51**	**$7.00**	**$3.94**	**$6.14**
Net profit/lamb @$3.50/kgLW	**$9.48**	**$7.59**	**$9.23**	**$5.62**	**$8.25**
Net profit/lamb @$4.00/kgLW	**$11.58**	**$9.66**	**$11.46**	**$7.29**	**$10.36**
Net profit/lamb @$4.50/kg/LW	**$13.68**	**$11.74**	**$13.68**	**$8.97**	**$12.47**
Net profit/lamb @$5.00kg/LW	**$15.78**	**$13.82**	**$15.91**	**$10.64**	**$14.58**

Changes based on a variation to the feed price ($AUD)

TABLE 1.2

Group	Cracked Wheat	Whole Wheat	Reid Cracked Grain Mix	Ridley Cracked Grain Mix	Ridley Pellets & Whole Wheat (50:50)
Cost of feed per tonne delivered	$400	$370	$600	$515	$440
Net profit/lamb @$4.00/kgLW	**$10.83**	**$8.58**	**$10.88**	**$6.64**	**$9.52**
Cost of feed per tonne delivered	$350	$320	$550	$465	$390
Net profit/lamb @$4.00/kgLW	**$11.58**	**$9.66**	**$11.46**	**$7.22**	**$10.36**
Cost of feed per tonne delivered	$300	$270	$500	$415	$340
Net profit/lamb @$4.00/kgLW	**$12.33**	**$10.75**	**$12.04**	**$7.95**	**$11.19**
Cost of feed per tonne delivered	$250	$220	$450	$365	$290
Net profit/lamb @$4.00/kgLW	**$13.07**	**$11.84**	**$12.61**	**$8.61**	**$12.03**

OBSERVATIONS

Feed intake rose quickly across all groups when the lambs reached 35 days of age

For the first 21 days of the experiment, all feed groups had an intake close to 50g per lamb per day. Consumption rose from this to approximately 200g per lamb per day in the following 14 days. This demonstrates how quickly lambs adapt to a ration change and highlights the need to measure feed intake on a regular basis. Failure to do this may result in profit erosion due to excessive consumption.

Consistent feed flow varied between groups

Feeders containing cracked grain mixes and high protein pellets required weekly cleaning to ensure consistent feed flow. The flow of the other feeders was considerably better, as a result fewer cleaning visits were needed.

OBSERVATIONS CONTINUED

Lambs per ewe varied between groups

At the commencement of the experiment each group had the same number of twins and triplets however, the numbers of lambs per ewe varied. The groups that had the higher survival rate received less milk per lamb and this likely led to lower growth rates. This variable makes the net profit per ewe an important metric to analyse.

Acknowledge maternal breeds when comparing results

Ideally, this experiment would be conducted with a single type of maternal ewe. However the large scale of this experiment resulted in us supplying two different types of maternal ewes. The results of groups that have different maternal breeds needs to be acknowledged when making comparisons. Eg. It would be hard to directly compare the “Whole Wheat” group against the “Ridley Cracked Grain Mix” because they had different breeds of ewes in the groups.

Whole wheat was the hardest feed type to control

At the completion of the experiment, the Upper and Lower Adjusters were required to be set to position 3 to limit consumption in the wheat group to approximately 200g per lamb per day. This was more restricted than any other group. Despite this, the average consumption over the 76 days was the highest at 286g per lamb per day. With the Advantage Feeders used, further restriction was possible but was not implemented in this case.

Whole wheat was highly digested

Close inspection of the dung from the two groups fed a ration containing whole wheat was examined. It was difficult to find undigested grains indicating little grain was passed from the rumen before microbial activity accessed starch in the kernel.

CONCLUSIONS

Further experimentation required before best feed performance can be determined

Due to the number of variables encountered during this experiment, the most significant being lamb survival rates (Table 1.0), means that no definitive conclusion can be made regarding the best feed for creep feeding. A future experiment that measures growth rates and identifies the litter size of the lamb would better indicate the performance of each feed.

The high protein pellets in this experiment were not suitable for creep feeding

In addition to the issue with the feed flow, the high protein pellets that were mixed with cracked wheat had two more issues. The lambs sorted the ration and left the high protein pellets in the trough. Additionally, and of more consequence, was that the pellets were affected by the wet and humid weather. The pellets went mouldy and caused the lambs to become ill, affecting their growth rates. The composition of this pellet was not suited to the environment of creep feeding.

The amount of starch in all feeds was adequate

There is no link between the amount of starch in each group and additional weight gain.

Making the starch more available by cracking or pelletising led to better feed conversions

The feed conversion ratio for the group fed whole grain was 5.2:1. Comparing this with the conversion ratios achieved by the other four feeds in this experiment suggests that cracking grain has a positive influence on digestibility. For example, the Ridley pellets and whole wheat ration (40% of its total grain content was cracked) achieved a conversion rate of 4.0:1 indicating that only a proportion of grains need to be cracked to achieve a low feed conversion ration. Repeated trials are needed to confirm this finding.

There was no link between the amount of protein and performance

The amount of protein contained in the feeds used in this experiment varied (Table 1.0). The lambs in each group received protein from their mother’s milk and the pastures they grazed. As a result, there does not appear to be a link between the amount of protein in the feeds tested and the additional growth rates recorded.

RECOMMENDATIONS

Creep feeding has a high return on investment

The experiment does not conclude which feed type is the most profitable however it does show that all creep fed groups grew considerably faster than the control groups and were more profitable. Using the values observed during the experiment and calculating the possible profit from feeding a commercial quantity of 200 lambs, a return of $1597.85 is possible for a feeding period of only 76 days. This return would see an Advantage Feeders 1800HD with creep panels paid off in as little as 4.3 months.

Fluctuating lamb prices has a moderate impact on profitability

Table 1.1 shows how a variation in lamb prices impacts the overall profit of each different creep feed ration. Based on feed prices remaining the same and the lambs per feeder increasing to 200, the break-even point is when lamb is $2.02/kgLW.

Fluctuating feed prices has only a small impact on profitability

Table 1.2 shows how a variation in feed prices impacts the overall profit of each different creep feed ration. With lamb valued at $4.00/kgLW, increasing and decreasing the feed price by $50/tonne, decreases and increases the profitability, on average of the five groups, by $0.78/lamb. The feed prices in this experiment were affected by drought conditions in eastern Australia. It is possible feed prices will fall in the future and the application of creep feeding will be more profitable than the results indicate here.

Depending on feed prices, barley can be more profitable than wheat

In the experiment we found that a feed with a starch content of 43% of dry matter (Table 1.0) is adequate to achieve high growth rates in creep fed lambs. Barley commonly has a starch content of approximately 65% making it suitable for creep feeding. Many factors go into choosing a feed however, on price alone, barley can be cheaper per unit of starch than wheat, making it an attractive option.

Consider all the factors when choosing a feed to use for creep feeding

Each farm will have its own unique circumstances to consider, including size, infrastructure, non-livestock farming, labour availability and intensity. A creep feed ration that is more profitable for one farm may be different to another farm.

- Do you have feed stored on your farm or do you have to organise for it to be purchased and delivered? There is a cost in organising the purchase, delivery and unloading of feed.
- Do you have the time and labour available to inspect and clean feeders weekly? If you do, all of the creep feeding rations tested would suffice. If not, consider a ration containing a whole or cracked grain component as these generally flow better and require less feeder cleaning.
- What storage is available to you? Some commercial feed companies can reduce the infrastructure and labour costs of storage by unloading directly into feeders upon delivery.

  Can you use leftover creep feed in other feeding applications? Some feeds cannot be stored for long periods so having the ability to use this feed in other applications can reduce waste.
- If livestock enter a finishing stage, what feed ration are they likely to have? Livestock entering a feedlot or high ration finishing system are likely to reach a high intake sooner if they have experienced that feed in their past.