Producer Research Support

Assessing the usefulness of faecal NIRS in assisting composite breeds to meet growth targets

BIA

The results from this project show that northern based equations for NIRS are not very useful in temperate pasture regions. While dry conditions reduced the sites that could provide typical samples, accurate predictions of weight gain on Mitchell grass indicated the equations for that type of feed can provide very good management advice.

For southern producers to be able to reliably use NIRS as a tool for pasture value predictions there will need to be a re-working of the predictions used to program the computer readers.

Key points

- Northern calibration equations do not allow general prediction of growth rate in temperate regions either from estimates of diet quality or from estimates of growth rate.

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The project

This study examined the usefulness of NIRS predictions based on northern calibration equations to predict cattle performance either directly or indirectly.

Objectives

1. assess the usefulness of faecal NIRS in predicting diet quality, animal growth and requirements for supplementation across a range of environments;

2. ensure composite (or cross bred) cattle meet growth targets from weaning to slaughter through the use of feed budgeting (and/or faecal NIRS) and tactical supplementation and at slaughter meet market specifications; and

3. improve the skills of cattle producers in feed budgeting and animal assessment and the use of NIRS.

What was done

Soil samples across the paddocks were taken at the beginning of the trial. Samples were then taken at about the same time of day every fortnight to determine the feed on offer. In addition, samples were taken of what was thought the cattle was selecting from the pasture.

Faeces was sampled every fortnight. At least 20 tagged cattle (including the 10 from which faeces was collected) were weighed and fat scored every four weeks. Weaner steers was selected for the trial so they could be part of the trial for the following 12 months. Cattle were drenched (also for liver fluke) at the start of the trial and then every four months and no growth promotants were used. Cattle were kept in paddocks for at least 4-6 weeks so that reasonable relationships between feed quality, faecal NIRS and animal growth could be made.

To ensure group training, members were instructed and engaged in the processes of feed budgeting, fat scoring, predicting animal growth rates, calculating pasture growth rates and forward planning decisions such as paddock moves or supplementation need, choice and amount.

Producer Research Support

MLA Producer Research Support offers support funding of up to $15,000 over three years for groups of producers keen to be active in on-farm research and demonstration trials.

These activities include:

- Producer Initiated Research and Development
- More Beef from Pastures demonstration trials
- Prime Time Wean More Lambs demonstration trials
- Sustainable and productive grazing grants.

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What happened?

The first objective was to make a preliminary assessment of faecal NIRS to allow better or earlier decisions to be made about matching nutrient supply (either through pasture and/or supplements) to targeted growth rates. Northern calibration equations were used.

The results indicate that northern calibration equations do not allow general prediction of growth rate either from estimates of diet quality or from estimates of growth rate. Cattle performance was better predicted at sites with C4 grasses rather than at sites dominated by sown C3 species. Mean actual growth rate at Mitchell was estimated to within ± 0.2 kg/day by NIRS predictions on approximately 71 percent of occasions. At this site predicted dietary digestibility also had high utility.

The second objective was to ensure composite (or cross bred) cattle met growth targets from weaning to slaughter through the use of feed budgeting (and/or faecal NIRS) and tactical supplementation. Mean start, finish and growth rates at the various sites are detailed in *Table 1*. Mean growth rates equalled or exceeded 0.6 kg/day at two of the four sites. Given the poor seasonal circumstances, the growth rates at all sites were satisfactory.

Table 1. Mean start weight, finish weight and growth rates of cattle at the four sites in the trial.

Site	Mean start weight (kg)	Mean finish weight (kg)	Mean growth rate (kg/day)	Days from start to finish
Ahern	341	506	0.596	281
Hamilton	218	380	0.686	236
Hoare	288	392	0.457	228
Mitchell	191	336	0.512	283

Discussion

Because of the drought and therefore the use of supplements, the relationship between NIRS predictions and weight gain was adversely affected.

That there wasn't a strong relationship between NIRS predictions and actual weight gain should not be interpreted as a failure of NIRS. The usefulness of NIRS at sites dominated with C4 grasses suggests it can be a useful tool for beef cattle producers. The results from sites dominated with sown C3 species suggests that separate calibration equations should be developed for these situations.

MLA also recommends
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The most robust and useful NIRS prediction for beef cattle producers was that most closely associated with actual growth rates. The results from this trial suggest that predicted diet digestibility and predicted growth rate are the two most promising candidates.

Next Steps

Discussions with consultants, beef producers and scientists have indicated the need to bring together representatives from the groups who have used NIRS technology to discuss a number of issues. These include:
1. summary of NIRS field and pen project results;
2. better determine the NIRS needs of consultants and beef producers; and
3. develop an approach to establish calibration equations for C3 pastures and the use of supplements.

The results show that the northern based equations for NIRS are not very useful in temperate pasture regions. The dry years during this project also reduced the sites that could provide typical improved pasture samples. Accurate predictions of weight gain on Mitchell grass indicated the equations for that type of feed can provide very good management advice. For southern producers to be able to reliably use NIRS as a tool for pasture value predictions there will need to be a re-working of the predictions used to program the computer readers.