The Feilding Faecal Egg Counters Trial

Ginny Dodunski BVSc MACVSc, Trevor Cook BVsc MACVSc

Abstract

A major frustration of current approaches to managing internal parasites on sheep farms is the inability to accurately predict when worm challenges above the norm are going to occur. A longitudinal survey of faecal egg counts and larval cultures from sheep breeding farms in the Manawatu was undertaken to assess whether changes in worm status between farms were similar enough to set up 'district worm monitoring sites' similar to the systems currently used for monitoring facial eczema spore counts.

There was no relationship between farms with respect to faecal egg count level or the magnitude of change in faecal egg count level, in ewes and lambs. There was a significant relationship between farms for the percentage of *Trichostrongylus* species in the worm burden of both ewes and lambs, but this relationship did not exist for the other major worm species, including *Haemonchus contortus*.

There was no relationship between the FEC of ewes and lambs on the same property, but there was a significant correlation between the species composition of the two groups over time, for *Trichostrongylus, Ostertagia* and *Haemonchus.*

It was concluded that district worm monitoring sites would not be useful in lowland Manawatu. These findings highlight the necessity of monitoring on the individual property, and the danger of extrapolating the results of worm testing across properties, even within a defined geographic location.

Background

The presence of sheep worm problems (beyond the 'normal' level of challenge) in a district is usually only recognized when clinical signs appear (scouring, dagginess, reduced growth performance). Anticipating these problems would enable preventative actions to be taken, such as shifting animals or shortening drench intervals.

A useful situation would be to have district monitoring sites where the status of different stock classes is regularly assessed. Changes at these sites could be used to trigger actions on a district front.

In New South Wales, the Department of Primary Industries publishes the results of all Faecal Egg Count submissions on their website, and via an E mailing list. The results are grouped by region and farmers can track FEC levels for their own district, which may be useful for triggering actions on their own properties.[1]

The changes in worm status on farms in a district need to be similar for district monitoring to be useful. The question we wished to answer is: Is district faecal egg count monitoring a useful tool in the Manawatu environment?

Specific questions:

1. Is there a pattern of change in ewe faecal egg counts which is consistent between farms over the summer/autumn period?
2. Is there a pattern of change in lamb faecal egg counts which is consistent between farms over the summer/autumn period?
3. Is there any correlation between farms with respect to species composition of the worm burden?
4. Is there any correlation between the pattern of FEC change between ewes and lambs on the same farm?
5. Is there any correlation between ewes and lambs on the same farm with respect to species composition of the worm burden?

Methodology

Two stock classes were monitored – ewes and lambs. Monitoring began on the week of 24th January 2005 and finished the week of 16th May 2005.

Ewes

- 8 mixed age ewe mobs on different farms were monitored.
- A ewe mob at each site was faecal egg counted every 2 weeks.
- Pooled samples from 10 ewes were used to enable the comparison of approximate FEC level and change at each site. The pooled samples were cultured to identify the worm species present.
- If the ewes were to be treated with an anthelmintic, 10 individually identified ewes were left untreated; these become the animals from which further samples are taken. If egg counts clearly showed a Barbers Pole Worm problem looming, all ewes were treated.

Lambs

- 6 lamb mobs on different farms were monitored. Three of these were on the same farms as ewe mobs in the trial.
- Farms where lambs are grazed on crop or new grass were excluded from the trial. All lambs in the trial spent the entire time on previously contaminated perennial pasture.
- At each site, 30 lambs were be identified, and split into 2 groups of 15.
- On the first sample date, one group of 15 was sampled for FEC and larval culture, and drenched with a combination drench; the other group was left undrenched.

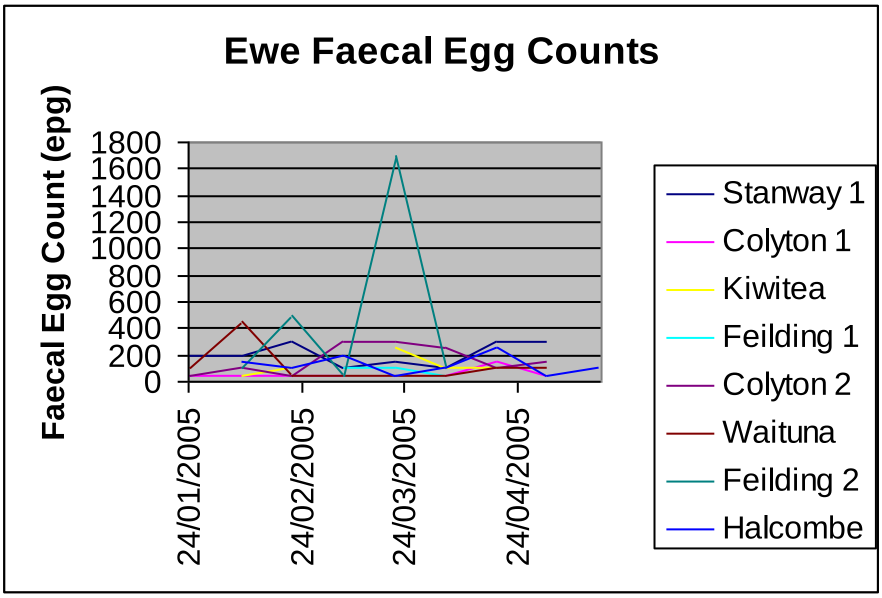
- Two weeks later, the undrenched group was faecal egg counted and larval cultured. At this time they received a combination drench.

- Two weeks after this, the first group was sampled and drenched; creating a two – weekly alternation of the groups such that each received a monthly treatment, but there was two – weekly FEC information.
- This alternation continued until the middle of May.
- At each collection, ten lambs were sampled and the faeces submitted for a pooled faecal egg count and larval culture.
- The timing of the drenching and sampling were coordinated to occur on all farms in the same week.

Results

FEC Results

Ewe FEC results



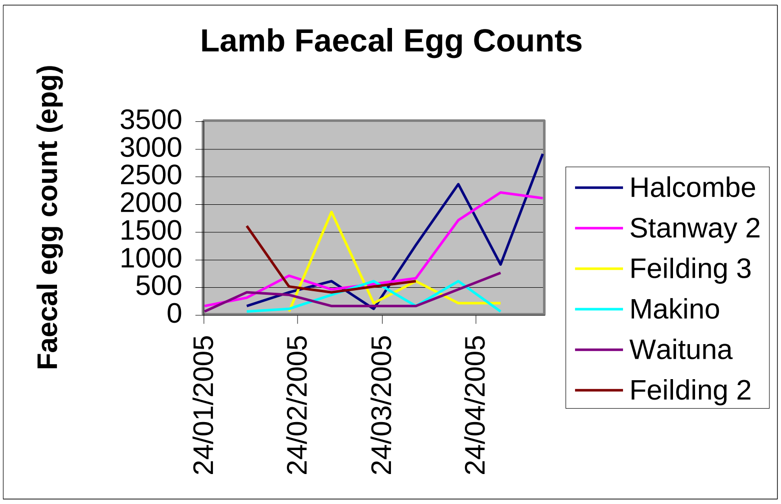
Each coloured line represents the FEC of the ewe mob on the individual farms. A single factor analysis of variance (ANOVA) of these data showed no correlation between ewe FECs over time on the different farms.

The variation between farms at each sampling was greater than any variation between time periods.

The spike in egg counts seen on one farm in the graph above was associated with a rise in the *Haemonchus* % in the larval cultures from that farm. This rise in egg count did not always occur when *Haemonchus* % rose on other farms.

On ‘Waituna’ and ‘Feilding 2’ farms, all the ewes received a drench, in mid – February and late March, respectively. No other ewe mobs were drenched.

Lamb FEC results



Data between period 2 (7th Feb) and period 8 (2nd May) only were used for the analysis, as there were not enough data from the first and last samplings.

A single factor ANOVA applied to these data showed no correlation between lamb FECs on the farms over time.

There was no correlation between ewe and lamb FECs on the same farm over time, although data were only available from 3 farms.

Worm species composition

Between – farm correlation

The only species which showed a significant correlation between farms over time was *Trichostrongylus*, in both ewes and lambs - there was more difference between sampling periods than between farms in the same period.

When an ANOVA was applied to these data, the difference had a P – value of 0.017. This is compared to corresponding non - significant values for *Cooperia* of 0.16 and *Ostertagia* of 0.16 also.

Trichostrongylus % in the ewes was highest in the early February sample period (Mean = 50%) dropping away to a mean of 20% in mid – May.

The lambs showed two peaks, with a mean *Trich* % of 55% at the end of January, which dropped to 19% in mid March and rose again to 42% in early May.

When an ANOVA was applied to these data, the difference had a P – value of 0.019.

This is compared to corresponding values for *Cooperia* of 0.15 and *Ostertagia* of 0.23.

There was no significant relationship between farms for *Haemonchus*; while a rise in % *Haemonchus* tended to occur on farms over a roughly similar period, the magnitude of the change varied greatly from farm to farm.

Within – farm correlation

Relationship for *Trichostrongylus* between ewes and lambs on same property

There was a significant relationship between % *Trichostrongylus* in ewes and % *Trichostrongylus* in lambs on the same property.

A regression analysis of these data gave a significance factor of 0.008, with an R^2 of 0.35.

Relationship for *Ostertagia* between ewes and lambs on same property

The significance factor for this relationship was less than for *Trichostrongylus*; at 0.05, with an R^2 of 0.22.

Relationship for *Haemonchus* between ewes and lambs on same property

As would be expected there was a strong relationship between Haemonchus % in the ewes and lambs on each of the three farms. This relationship had a significance factor of 0.0004, with an R^2 of 0.55.

There was no relationship between faecal egg count and species composition, for ewes or lambs.

Discussion

The power of the analysis may have been improved if samples had been obtained from every farm at every sampling episode. Only one of the lamb farms sent samples on every date. The situation was similar with the ewes, with gaps in the data for most of the farms. However the ewe egg counts changed so little on the majority of the farms that the result is unlikely to have been greatly affected.

Egg counts

It is perhaps expected that there was no relationship between farm egg counts in either stock class, given the inevitable variations in pasture contamination, feed levels, stock policies and management between properties. All were breeder/finisher farms within a small geographic area, but the variations in the above factors would still be expected to be significant.

Worm species changes

The similarity within an area with respect to dominant worm species at different times of the season is an accepted phenomenon.[2,3,4] However given the lack of correlation between farms for all species apart from *Trichostrongylus*, we would caution against extrapolating individual species percentages from one farm to another.

In general *Trichstronglyus* levels in lambs tended to fall through the first half of the trial and rise again in the last six weeks. The ewes did not show this second rise.

Had the sampling commenced earlier in the season we may have seen a relationship between farms for *Ostertagia* and possibly *Nematodirus.*

It is interesting to note that there was no association between the farms for *Haemonchus*. This highlights the importance of monitoring on the individual farm. In practice we often see individual farms where *Haemonchus* is an issue, whereas other nearby farms seem unaffected.

The correlation between species on the same farm for *Trichs, Ostertagia* and *Haemonchus* (in particular) in ewes and lambs was expected. This may provide some reassurance for those wishing to use adult ewes as a source of refugia in their grazing systems. However it would be good to repeat the exercise over a larger number of farms and a wider geographic area.

FEC versus worm species

Moderately high faecal egg counts (> 1000 epg) were not always associated with a high *Haemonchus* percentage in the larval culture.

Egg counts greater than 1000 epg were associated with a predominance of *Trichostrongylus* as often as they were with *Haemonchus.* This has been reported by other workers.[5]

Conclusions

The lack of association between farms with respect to egg counts is perhaps not unexpected, given the variation that exists between farms, even of the same enterprise type in one location.
Our findings would suggest that the use of district FEC 'monitor sites' as a guide for farmers on their own properties is not especially helpful. The worm status on an individual property can only be assessed by monitoring on that property.

In this trial we found that high egg counts were not always associated with *Haemonchus contortus.* This finding has practical relevance to decision -making around drench product choice.

Knowledge of the predominant worm species on a farm at particular times of the year is likely to be useful.

The results from this trial suggest that *H contortus* may not show consistent changes between farms and monitoring on an individual farm basis is important. There was a relationship between farms for *Trichostrongylus,* however as larval cultures are not currently a routine part of week to week worm monitoring, the practical application of this information is currently limited.

The overriding conclusion from this work is that the worm situation on an individual farm is unique to that property. It is important that farmers do not make management decisions based on monitoring from properties that may not reflect their own situation.

References

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Acknowledgements

Many thanks to the farmers who participated in the trial, to Robert Fletcher for the data analysis, and Meat and Wool New Zealand for their generous sponsorship.