Utilizing Worm Biology & Lamb Resilience to Minimize the Use of Dewormers

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Abstract
Drug resistance has become a serious problem for sheep and goat producers in Ohio. Many flocks now demonstrate some level of drug resistance to all approved classes of dewormers. When resistance develops to all three chemical classes of dewormers, producers must have some means of continuing in production. The objective of this study was to grow lambs on pasture at a time so as to eliminate the use of anthelmintics. Wether lambs, Dorset/Marino crossbreed, were randomly sorted into six pens, three replications and equally divided according to fecal egg shedding. In total thirty five lambs were utilized in the trial. Three groups were randomly selected for drug treatment while three groups received no anthelmintic products. All groups were grown on fescue pasture with full feed/self feeder for 107 days starting October 1st. Results indicated, $p<.05$, that there was no significant difference between treated and untreated groups in feed efficiency.

Introduction
Fewer chemical classes, how we use them, and how frequently we use them all play a role in the development of drug resistance. As most producers understand, individual animals vary in their level of resistance to internal parasites. In general, younger animals and nutritionally stressed animals are more susceptible to parasite infestation. Understanding parasite biology and reducing nutritional stress can reduce the need to utilize chemical dewormers.

At the Eastern Agricultural Research Station (EARS) in Belle Valley, Ohio we decided to evaluate lamb resilience to internal parasites when fed concentrate on pasture.

Methods
Six groups of wether lambs were randomly sorted into six pens, three replicates and equally divided according to fecal egg shedding. In total 35 lambs were utilized in the trial. Three groups were randomly selected for drug treatment, while three received no anthelmintic product. Researchers utilized the modified McMaster egg counting technique. All groups were grown on fescue pasture with full feed feeders for 107 days, starting Oct. 1, 2004 and ending Jan. 15, 2005.The lambs were fed on the same pasture used for lambing and heavily utilized by sheep throughout the year.

Lambs were weaned in September and vaccinated for CD&T. All lambs had free access to a soy hull concentrate ration (Table 1), and access to water and trace mineralized salt.

Table 1: Supplement Formulation

Ingredient	
Soybean Hull Pellets	**80%**
Corn	**16%**
Limestone	**4%**

Results

Lambs were weighed at the beginning and end of the trial (Table 3). Fecal egg counts were recorded for all lambs at the start and end of the trial (Table 4).

For this trial anova: single factor statistical analysis was used to analyze data for feed efficiency, fecal egg counts, and average daily gain.

Table 2: Anova: Single Factor, Alpha=0.05

Null Hypothesis: There is no difference between the average daily gains of the 2 groups. Alternate Hypothesis: The treated group has a higher average daily gain. Because the p-value, 0.328884412 is greater than the chosen alpha value 0.05, we accept the null hypothesis. Conclusion: The treated group seems to have the same ave. daily wt. gain as the untreated group.
Null Hypothesis: There is no difference between the 2 groups in their lb. feed per lb. of gain. Alternate Hypothesis: The treated group has a greater lb. feed per lb. of gain. Because the p-value, 0.6213961 is greater than the chosen alpha value 0.05, we accept the null hypothesis. Conclusion: There is no difference in the lb. feed per lb. of gain in the 2 groups.
Null Hypothesis: There is no difference between the fecal counts of the 2 groups. Alternate Hypothesis: The treated group has a lower fecal count. Because the p-value, 0.001841255 is less than the chosen alpha value 0.05, we reject the null hypothesis and accept the alternate hypothesis. Conclusion: The treated group has a lower fecal count using a 5% level of significance.

Table 3: Average Lamb Performance

Item	Treated	Untreated
# of lambs (lambs/pen)	17 (5.6)	18 (6)
Starting weight	66.2	63.2
Ending weight	118	112
Avg Daily Gain	.48	.46
Lb. feed per lb. gain	6.46	6.76

Table 4: Fecal Egg Counts

Item	Treated	Untreated
Avg Beginning fecal egg count (eggs per gram)	503	500
Avg Ending fecal egg count (eggs per gram)	±18*	186
*Note: Sensitivity of McMasters questionable at these low levels.		

Discussion/Conclusion

Researchers indicate that for these lambs at this location fecal egg counts for treated and untreated groups did significantly vary, suggesting that the drug was effective. Although the anthelmintic did work there was no significant difference between treated and untreated groups in feed efficiency or rate of gain.

The parasite of primary concern in this study was *Haemonchus contortus*. Although the lambs appeared to be significantly challenged at the start of the trial we would expect *Haemonchus* activity to decline as we move into the winter. This would partially explain the reduction in egg counts for both groups. In addition, it appears lambs fed grain supplement may become resilient to worms. The exact period of *Haemonchus* inactivity is difficult to assess since it is at least partially weather dependant. At this location it appears that we can finish these lambs on pasture utilizing supplementation and not deworm. We feel by not deworming we minimize parasite drug exposure.

Future plans – the extent of lamb resilience through the use of feed needs further testing at a period of prolonged parasite challenge.

Vaccinating Sheep

Counting Fecals