Impact of Deworming Treatments on Intestinal Parasite Load in Equines from Middle Tennessee

Ellen Goertzen

Deans' Distinguished Essay Award recipient

Abstract

In this study fecal egg counts were performed on horses in six barns in Middle Tennessee to assess parasite load and the effectiveness of deworming programs. Samples were collected and tested before and after deworming and results found through the McMaster technique were compared with currently practiced deworming programs. Results showed the presence of parasites in all barns, though parasite load varied with a number of factors such as consistency of treatment, deworming frequency, and products used. All deworming products were found to be effective. This research provides insight to a more informed alternative deworming protocol, based on actual parasite load, than is typically used throughout the horse industry today. Future studies are suggested to compare the effectiveness of rotating products vs. use of a single product, and evaluating parasite load of stallions vs. mares or geldings.

I. Introduction

Internal parasites are a recurring health issue in all horses. These parasites live in organs, body cavities, and tissues, using the host animal as their source of nutrition. Though low levels of parasites cause no significant harm, a small percentage of horses may develop a high level of parasitemia. Symptoms of a parasite infestation include poor growth, poor hair coat quality, weight loss, decreased feed efficiency, colic, diarrhea, pneumonia, and even death (Peregrine et al. 2014).

The most common types of parasites are large and small strongyles, ascarids, tapeworms, pinworms, and bots. While all of these types can present health concerns for horses, small strongyles are potentially the most difficult to eradicate and pose the most serious problems, and make up 95-100% of the eggs seen in fecal tests. Small strongyle larvae burrow into the intestinal lining and can remain encysted and dormant for months. While in this stage, the larvae are not affected by most treatments, and can cause significant damage to the intestinal lining as they emerge from their encysted state (Peregrine et. al 2014).

Rather than becoming encysted, large strongyle larvae migrate through blood vessels to the arteries in the intestinal tract, where they block blood supply and can cause blood clots to form. The eggs are passed in feces, where they hatch into larvae and continue the life cycle. Ascarids, commonly known as roundworms, are a health issue in horses less than 2 years of age, but older horses develop a natural immunity. Tapeworms and bots can also cause major health concerns, while pinworms are considered a more minor health threat (Traversa et. al 2007).

Routine treatment is available for all of these parasites in the form of oral deworming pastes containing various drugs to target specific parasites. Pastes are administered using syringes that can be bought in most farm supply stores. Horse owners typically follow a specific program, which may vary significantly between different barns. Most horse owners design their program based on assumption of parasite load, and the treatment being prophylactic rather than to eradicate a known problem. Typical deworming programs involve treating all animals on the property every 6-10 weeks. However, treatment this frequent may contribute to an increase in parasite resistance to dewormers. According to Peregrine et al., resistance to all types of dewormers has increased in the past ten years (2014). This suggests a need for a new approach involving deworming less frequently, in accordance with actual parasite load as determined by fecal egg count tests.

Several broad-spectrum drugs are used to treat for parasites, including ivermectin, moxidectin, praziquantel, pyrantel pamoate, pyrantel tartrate, fenbendazole, and oxibendazole. They function by interrupting the life cycle of the parasites (AAEP 2013). Table 1 lists common drugs and some of their most common brand names.

Table 1. Common anthelmintics, brand names, and parasites treated.

Drug	Common product	Targeted Parasites
Ivermectin	Zimecterin, IverCare, Bimectin, Equalvan, Rotectin 1, Equimectrin, Duramectin	large and small strongyles, ascarids, pinworms, bots
Moxidectin	Quest	large and small strongyles (in encysted state), ascarids, pinworms, bots
Praziquantel (in addition to)	Quest plus (moxidectin); EquiMax and imecterin Gold (ivermectin)	large and small strongyles (in encysted state), bots, **tapeworms**
Pyrantel Pamoate	Strongid, Strongid-T, Rotectin P, StrongyleCare, Exodus	large and small strongyles, ascarids, some pinworms
Pyrantel Tartrate	Strongid C2X, Continuex, Pellet-Care P	large and small strongyles, ascarids, pinworms
Fenbendazole	Panacur, Safe-Guard	large and small strongyles, ascarids, pinworms
Oxibendazole	Anthelcide EQ_	large and small strongyles, ascarids, pinworms, threadworms

*All table information taken from SmartpakEquine.com ("Horse Dewormer Supplements," 2012).

Praziquantel is the only drug found to be highly effective (SmartpakEquine.com). Pyrantel tartrate is the only feed-through dewormer, in which a small dose is mixed into the horse's feed every day. This type of dewormer was not investigated in this study.

Deworming dosage is calculated based on the horse's weight. Horse dewormers come in a disposable oral syringe, the shaft of which is notched and has a small rotating piece that can be used to adjust the dose. A calibrated scale is the only accurate way to determine a horse's weight, but is not available to most horse owners; alternative ways to estimate weight include weight tapes, measurement calculations, or eyeball estimations.

Another product some horse owners use to deworm is diatomaceous earth mixed with their daily feed. Theoretically, the "scrubbing action" of the diatoms sufficiently injures the parasites. Proponents claim that it causes a significant reduction in parasites, healthy weight gain, and does not cause parasite resistance to dewormers. While diatomaceous earth is marketed as a completely natural product that contains no chemicals, there have been few if any scientific studies to confirm its effectiveness or recommended dosage for deworming.

Deworming programs usually involve treatment every 6-10 weeks, typically rotating the drug used. Due to an increase in parasite resistance to deworming drugs, some veterinarians currently advise deworming less often. According to the American Association of Equine Practitioners, over-use of dewormers increases the rate at which parasites develop resistance (2013). A common mentality among horse owners is to completely eradicate all parasites in the barn, deworming all horses often enough to be sure that there is no risk. The negative

effects of this approach include unnecessary expense for the owners, increased parasite resistance, and often administering drugs to horses that have no need for them. It has been noted that horses have a some ability to develop immunity, and low parasite population may in fact help horses maintain that immunity (Baudena 2003). Therefore, the goal of horse owners should not be to eradicate parasites entirely by overuse of drugs, but to minimize parasite load to an acceptable level.

Owners can take measures other than dewormers to minimize parasite load. Horses should be turned out on pasture with a ratio of 1 horse per 2 acres, allowing them to graze and deposit manure in separate regions. On pasture space that is too small, horses are forced to eat and defecate in the same area, increasing the amount of parasite eggs or larvae ingested. If this is the only possible turnout situation, manure can be removed from pasture at least weekly. According to the American Association of Equine Practitioners, parasites do not typically survive cold winters or hot, dry summers, so it is unnecessary to deworm horses during these times of year (2013).

Not all horses are equally susceptible to parasites; whether this is immune- or behavior-related is unknown (Baudena 2003). Therefore, the best way to determine the parasite load of individual horses is to conduct routine fecal tests on each animal. This would allow owners to classify horses as high, intermediate, or low egg shedders, depending on their count of eggs-per-gram (EPG) of fecal matter. High loads may appear either because the horse was not dewormed in a long period of time, because it is naturally susceptible to parasites, or parasites display resistance to treatment. Typically, adult small strongyle eggs compose nearly 100% of eggs seen in fecal tests (Kaplan & Nielsen 2010).

Horses on a regular deworming schedule should be tested before and after deworming to determine effectiveness. Horses that are not regularly dewormed should be tested before and after deworming for two or three successive dewormings. Owners can use the results of fecal tests to design a deworming program for their barn in which they deworm horses according to their need. It is important to base a program on the individual horse because 20% of horses in a herd carry 80% of the parasite load (Haffner, 2012). For purposes of this study, recommendations were made that high contaminators be treated 4 times yearly, intermediate contaminators 3 times yearly, and low contaminators twice yearly.

The purpose of this study is to survey and determine parasite load in horses in barns in and around Murfreesboro, TN, in which the deworming programs differ. Results and the effectiveness of current deworming practices will be analyzed, and a program based on the data will be designed for each barn. It was my hypothesis that barns that deworm relatively frequently will be expected to show minimal parasite load, while barns with infrequent, inconsistent, or no deworming program will show a relatively high parasite load. Results for individual horses may vary due to behavioral or intrinsic qualities, but the overall trend of each barn is expected to be consistent with that hypothesis.

II. Materials and Methods
Collection of Data

Data was collected from six barns in the Middle Tennessee area. For barns that followed a deworming program, details were noted about the program such as what products were used, dates of treatment, and dosage. The lack of a deworming program was also noted. For barns with more than 20 horses, a representative sample was tested. For barns with less than 20 horses, all horses were tested, though the number of horses with two samples varies due to horses being moved on or off the property during the period of this study. Table 2 lists some general information about the barns.

Table 2. Deworming programs in each barn.

Barn	# of Horses	Frequency of Deworming	Rotate Dewormers?	Initial (Before Deworming) Collection Date	Final (After Deworming) Collection Date
A	24	8 weeks	yes	2/28	3/16
B	70	8 weeks	no	2/15	2/29
C	5	n/a*	n/a*	2/15, 3/28	4/13
D	8	twice yearly	no	2/10	n/a*
E	20	twice yearly	yes	4/15	4/28
F	5	twice yearly	yes	4/21	5/4

*n/a: not available

Each barn was surveyed either by phone or in person for general information. The questions asked were:

- How many horses are housed at your facility, and how many are on the same deworming program?
- Do the horses generally have a similar level of exercise and turnout?
- What is the turnout situation? Are the horses usually stalled, in pasture, or both?
- About how many horses are turned out in each pasture, and what is the estimated size of those pastures?
- Do horses on turnout have access to pasture, or are they on a dry lot? Is hay provided?
- How often are the horses dewormed?
- Have you ever done a fecal egg count on any of the horses?
- Do you ever remove manure from pastures? If so, how often?
- Do you practice any rotational stocking in pastures?
- How do you determine the amount of dewormer each horse gets? Do you estimate weight, use weight tapes, use a scale, or give 1 tube per horse?

Data for each horse was noted including name, age if known, sex, body condition score, location, and deworming history.

Fecal material for each horse was collected in a Ziploc bag and labeled with a sharpie. Notes and other information were recorded in a notebook. Material was collected 1-2 days before deworming, and again 10-14 days after deworming, a length of time recommended by the American Association of Equine Practitioners to evaluate effectiveness of deworming

(AAEP 2013). Samples were kept on ice at time of collection and stored in a freezer for later testing. They were thawed under hot water prior to testing.

Barn C, which practiced no deworming, was tested a total of 3 times: first to assess the parasite load, then again just before deworming, and finally 10-14 days after deworming. Barn D was able to complete only the "before deworming" testing before withdrawing from the study.

Parasite Identification

Fecal eggs-per-gram (EPG) tests, or fecal counts, were performed for each sample using a McMaster slide kit (Chalex Corp., Wallowa, OR). This test determines approximate parasite load based on counting parasite eggs and multiplying by a factor of 25.

Frozen samples in sealed plastic bags were thawed under hot water. First, 26 ml of Fecatect (a liquid that promotes egg flotation and concentration) was added to the vial, up to the first line. Then, 4 g of fecal material were added and mixed thoroughly, bringing the mixture up to the second line of the vial at 30 ml. The mixture was poured through a sieve into a paper cup to sift out large fibers and other material. The mixture was drawn up into a syringe and injected into the two chambers of the McMaster slide, so that each chamber was full and there were no air bubbles. The slide was examined under 10x power, magnifying the eggs 100 times. Each chamber was examined separately and the egg counts totaled. At this magnification, the width of each column of the grid could be easily seen, and eggs were counted by column. Total eggs counted in each sample were recorded. Each chamber holds 0.15 ml of the mixture, for a total volume of 0.3 ml per slide. Because the mixture started with 4 g fecal material, the egg count is multiplied by 25 to determine the approximate number of eggs per gram of fecal material ("Paracount-EPG Fecal Analysis Kit, 2012).

Parasite eggs were identified based on appearance, based on a publication by Utah State University Cooperative Education (Evans, 2009). Large and small strongyle eggs are identical in appearance, but that is not significant considering all dewormers treat both types of strongyles. Strongyle eggs were the only type seen in fecal egg count tests performed in this study.

Each horse was classified as a low, medium, or high contaminator based on their fecal count results, on a scale utilized by Kaplan and Nielsen (2010). The contamination levels are:

0-199 epg: low contaminator

200-499 epg: medium contaminator

500+: high contaminator.

After identification of parasites for each barn, recommendations were made suited to each barn based on results of their individual horses. It was recommended that barns deworm low contaminators in early spring and late fall with a dewormer that treats tapeworms, because they may not appear on a fecal test of a horse infected with tapeworms. Medium contaminators should be treated these two times plus an additional treatment

in the summer. High contaminators should be treated as such plus another additional treatment in the summer, and dewormers should be rotated.

III. Results and Statistical Analysis

Raw Data and Results

Results showed that parasite eggs were recovered from 55% of the total horses tested. In this study, fecal material from a total of sixty horses residing at six different barns was examined for the presence of parasite eggs. Of all horses examined, 33 (55%) were positive for the presence of parasite eggs. The overall parasite burden was divided into three categories (low, medium, high). Information about the horses and egg recovery for each of the 6 barns tested in this study are provided in Tables 4-9 (Appendix A). Horses that tested positive for parasites were present in each barn studied. Bar graphs comparing the relative egg burden of each horse before and after deworming treatment are listed in Figures 5-10.

In Barn A (Table 4), 2 of the 12 horses tested positive for parasites (16.7%), an average of 23 eggs per horse before treatment and 4 eggs per horse after treatment, an 82.6 percent reduction in total parasite load. Both the positive horses were classified as low contaminators. A bar graph with horse names and egg counts before and after deworming treatment is listed in Figure 5.

In Barn B (Table 5), 9 of the 20 horses tested positive for parasites (45%), an average of 454 eggs per horse before treatment and 0.8 eggs per horse after treatment, a 99.8% reduction in total parasite load. Here, 6 were classified as high contaminators, 1 was medium, and 2 were low. A corresponding bar graph of parasite positive horses is provided in Figure 6.

In Barn C (Table 6), all of the 5 horses tested positive for parasites (100%), with an average of 820 eggs per horse before treatment and 0 eggs per horse after treatment, a 100% reduction in total parasite load. Four were classified on high contaminators and 1 was medium. A corresponding bar graph of parasite positive horses is provided in Figure 7.

In Barn D (Table 7), 6 of the 8 horses tested positive for parasites (75%), with an average of 397 eggs per horse before treatment. In this case, 3 horses were high contaminators, 2 were medium, and 1 was low. A corresponding bar graph of parasite positive horses is provided in Figure 8.

In Barn E (Table 8), 6 of the 10 horses tested positive for parasites (60%), with an average of 263 eggs per horse before treatment and 0 eggs per horse after treatment, a 100% reduction in total parasite load. Two horses were high contaminators, 2 were medium, and 2 were low. A corresponding bar graph of parasite positive horses is provided in Figure 9.

In Barn F (Table 9), all 5 horses tested positive for parasites (100%), with an average of 1295 eggs per horse before treatment and 0 eggs per horse after treatment, a 100% reduction in parasite load. Here, 3 horses were high contaminators, and the remaining 2 were low. A corresponding bar graph of parasite positive horses is provided in Figure 10.

Information about horse care procedures (turnout, stocking rate, manure removal in pastures) and previous parasite deworming procedures are provided in Table 10. In Barns A and B, the majority of the horses were negative for parasites. These barns had the highest population of horses on the property at 24 and 70, respectively. Other than these two data points, there appeared to be no correlation between number of horses and percentage of horses positive for parasites. Barn A showed the lowest percentage of parasite positive horses (12.5%) and B showed the second lowest percentage (45%). The deworming programs at these two barns were similar, treating all horses every 8 weeks. Barn A rotated deworming products, while Barn B used the same products for each treatment. A corresponding bar graph is provided in Figure 11.

Factors that did not seem to correlate with parasite load include number of hours per day of turnout, stocking rate, and manure removal. A bar graph corresponding with the number of hours turned outside per day is provided in Figure 12. Stocking rate also did not seem to correlate with parasite burden; Barn F, with the lowest stocking rate of 0.09, showed 100% parasite infection. Barn A, which had the highest stocking rate of 3.8, had the lowest parasite burden of just 12.5%. Other than these two data points, there appeared to be no correlation between stocking rate and parasite load. A corresponding bar graph is provided in Figure 13. Barns D and E practiced removal of manure from pastures, but the majority of horses in each of these barns were positive for parasites, which was also the case in Barns C and F, which did not practice manure removal. Barns A and B had less than 50% parasite load, but also did not practice manure removal.

Statistical Analysis

Total means and standard deviations

____The average eggs per horse before treatment for all barns combined was 428.75 (± 683.44). The average eggs per horse after treatment for all barns combined was 1.44 (± 5.89). This data is shown in Figure 1.

Figure 1: Means and standard deviations for all barns combined

Analysis Variable : epgbefore		
Sum	Mean	Std Dev
25725.00	428.75	683.44

Pairwise Comparisons of all Barns

Proc anova in SAS shows that at least one of the barns is significantly different in parasite load before treatment ($p = 0.0078$). Further analysis by Tukey's adjustment for multiple comparison shows that before treatment parasite loads are significantly different between Barns A and F ($p = 0.0040$), and Barns E and F ($p = 0.0403$). This data is shown in Figures 2 and 3.

Figure 2: Comparison of all barns

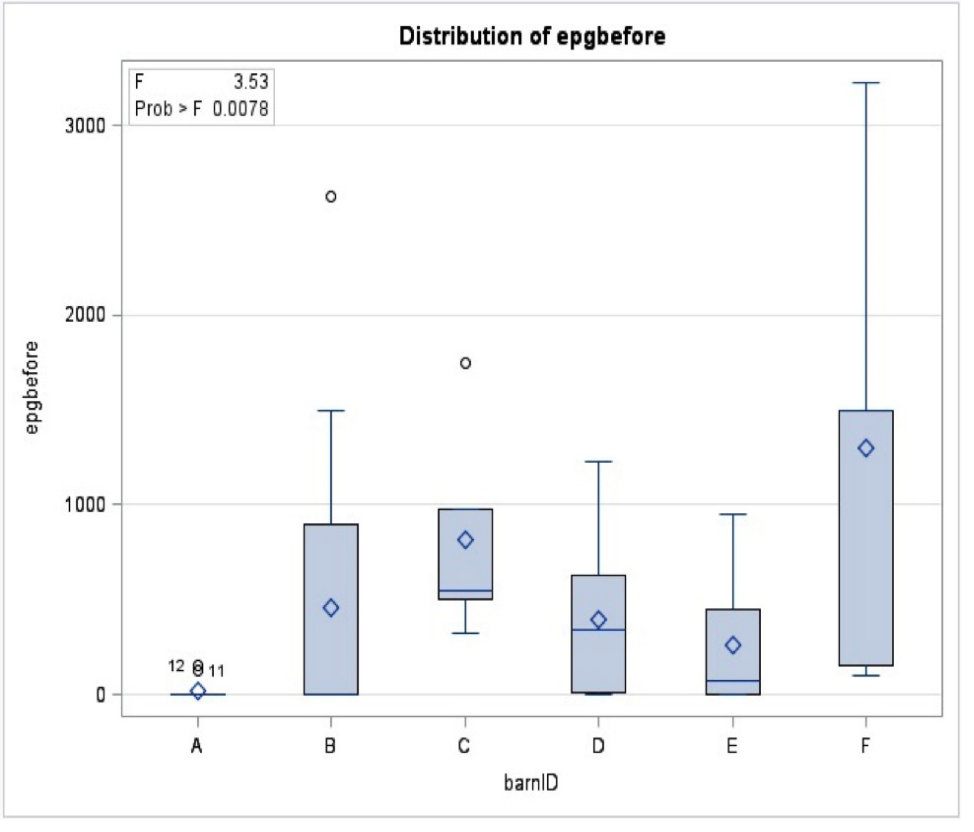


Figure 3: Least squares means and p-value matrix for Barns A-F

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

barnID	epgbefore LSMEAN	LSMEAN Number
A	22.91667	1
B	453.75000	2
C	820.00000	3
D	396.87500	4
E	262.50000	5
F	1295.00000	6

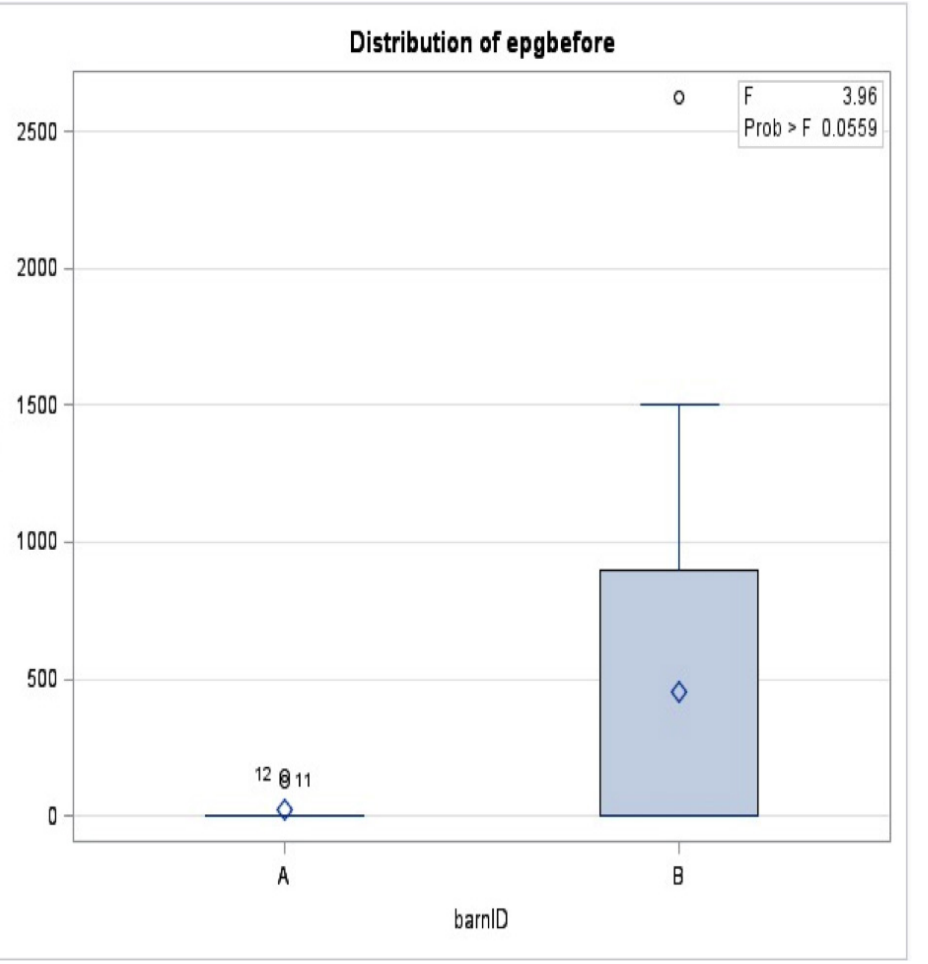
Least Squares Means for effect barnID
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: epgbefore

i/j	1	2	3	4	5	6
1		0.4118	0.1695	0.7721	0.9443	0.0040
2	0.4118		0.8438	0.9999	0.9670	0.0891
3	0.1695	0.8438		0.8364	0.5756	0.8296
4	0.7721	0.9999	0.8364		0.9974	0.1306
5	0.9443	0.9670	0.5756	0.9974		0.0403
6	0.0040	0.0891	0.8296	0.1306	0.0403	

Comparison of Barn A and Barn B

A comparison of Barns A and B was of interest due to their similarities in deworming protocol. There does appear to be a trend in the raw data that Barn A had a lower parasite load before treatment than Barn B. However, proc glm in SAS showed that this difference was not significant (p = 0.0559). This data is shown in Figure 4.

Figure 4: Parasite load before treatment in Barns A and B



Parasite load before treatment averaged over sex

Proc glm in SAS showed that parasite load differences between mares and geldings were not significant (p = 0.2462). The stallion at Barn B had the only significant difference between sexes, showing a higher parasite load than the mares and geldings at Barn B (p = 0.0065).

Table 3: Parasite load before treatment averaged over sex

Barn	M (mares)	G (geldings)	S (stallions)
A	21 ± 51 (n = 6)	25 ± 61 (n = 6)	n/a
B	650 ± 764 (n = 4)	257 ± 487 (n = 15)	2625 ± 0 (n = 1)
C	525 ± 35 (n = 2)	1017 ± 713 (n = 3)	n/a
D	279 ± 269 (n = 7)	0 ± 0 (n = 1)	1225 ± 0 (n=1)
E	412 ± 487 (n = 4)	163 ± 199 (n = 6)	n/a
F	1608 ± 1565 (n = 3)	825 ± 955 (n = 2)	n/a

IV. Discussion

Parasite infection was prevalent in each barn in this study. In all 6 barns, parasites were found in varying amounts. The average eggs per horse before treatment for all barns combined was 428.75 (± 683.44) (Figure 1). This mean falls in the "intermediate contaminator" category of egg-shedders, supporting the conclusion that horses in the mid-South region typically have a moderate parasite load. Parasites are in fact a significant issue that must be treated aggressively to produce parasite-free horses. The average eggs per horse after treatment for all barns combined was 1.44 (± 5.89), which can be considered equal to 0 due to the large standard deviation. Basic trends from the raw data appear to show that barns that dewormed relatively frequently had minimal parasite loads, and barns with infrequent or no deworming program had relatively high parasite loads. However, further statistical analysis shows minimal differences between barns.

One might expect Barns C and D, which had no regular deworming program, to show higher parasite load before treatment than the other barns. Surprisingly, the only significant differences between barns were Barns A and F, and Barns E and F (Figure 2 and 3). These results may indicate some natural immunity of horses that were not routinely dewormed, or even some parasite resistance in horses that are regularly dewormed.

Barns A and B were of interest because both had a very similar deworming program. Because both programs included recurring treatments every 8 weeks, the "before treatment" samples can be assumed equal to "8 weeks after treatment" values and therefore of interest when comparing effectiveness of these two barns. The only differences between these barns are products used rotation of products vs. single product and location of the barn. Barn A rotated products, treating with a different drug each deworming, while Barn B used the same drug (moxidectin) every time, with the addition of praziquantel every third deworming. The author recognizes that location may in fact be an important factor, but due to the observational nature of this study, one must assume location is nonsignificant in order to evaluate differences between products used. There does appear to be a trend that Barn A had a lower parasite load before treatment than Barn B (Figure 4). However, proc glm in SAS showed that this difference was not significant ($p = 0.0559$). Further studies are needed to evaluate the benefits of deworming programs that rotate products vs. use a single product.

References

AAEP Parasite Control Subcommittee of the AAEP Infectious Disease Committee (2013). "AAEP Parasite Control Guidelines." *American Association of Equine Practitioners*.

Baudena, Marie (2003). *Equine Immunity to Cyathostome Infections* (Doctoral dissertation). Louisiana State University and Agricultural Mechanical College.

Evans, Patricia, and Kerry Rood (2009). "Fecal Egg Count Tests Improve Deworming Programs." *Utah State University Cooperative Extension.*

Haffner, John. Personal interview. 10 Feb. 2012.

"Horse Dewormer Supplements." SmartPakEquine.com. Web. 2 Feb. 2012. <www.smartpakequine.com/horse-dewormer-supplements.aspx>

Kaplan, R. M., and M. K. Nielsen (2010). "An evidence-based approach to equine parasite control; It ain't the 60s anymore." *Equine vet. Educ.*, 22(6), pp. 306-316.

"Paracount-EPG Fecal Analysis Kit With McMaster Counting Slides." ChalexCorporation. Web. 10 Feb. 2012. <http://www.vetslides.com/EPGfecalkit.html>

Peregrine, Andrew S., Marcelo Beltrão Molento, Ray M. Kaplan, and Martin K. Nielsen (2014). "Anthelmintic resistance in important parasites of horses: Does it really matter?" *Veterinary Parasitology*, 201, pp. 1-8.

Traversa, Donato, Raffaella Iorio, Thomas R. Klei, Vitaliy A. Kharchenko, Jakub Gawor, Domenico Otranto, and Olivier A. E. Sparagano (2007). "New Method for Simultaneous Species-Specific Identification of Equine Strongyles (Nematoda, Strongylida) by Reverse Line Blot Hybridization." *Journal of Clinical Microbiology*, 45 (9), pp. 2937-2942.

Sex of the horses was considered a potential factor in determining parasite load before treatment. Proc glm showed that mares and geldings did not differ significantly in parasite load before treatment ($p = 0.2462$). The stallion at Barn B did show a significantly higher load than the mares or geldings at Barn B ($p = 0.0065$), but this effect can not be validated considering there was only one stallion at Barn B. The stallion at Barn D did not show a significantly higher parasite load than the mares or geldings at Barn D (Table 3). Based on these statistics, this study concludes that sex is not an important factor in determining parasite load. However, raw data suggests that both stallions in this study had higher parasite loads than mares or geldings, so further studies may be of interest to evaluate this conclusion.

In some cases, parasite infection did appear to affect the health of the horses. A few of the horses in Barn C had long, rough hair coats and pot-bellied appearance. One of the horses, a recent rescue, was very thin at a body condition score of 3, and appeared to be in poor health condition. It also carried one of the heaviest parasite burdens in the study at 1750 eggs-per-gram before deworming; however, this difference is not supported by statistical analysis. Horses in Barn D were dewormed twice yearly with diatomaceous earth, a remedy that is considered by many veterinarians to be ineffective (Haffner, 2012). However, these horses had a better physical appearance and their health seemed unaffected by the parasite burden. It is well known that well-fed, otherwise healthy animals tolerate parasite burden better than poorly fed or otherwise unhealthy animals. The affect of parasites on the horses' health may depend on many other factors such as age, duration of infection, nutrition, and environment.

Treating all horses without knowledge of their contaminator level in an unnecessary expense. Also, deworming programs depend on horse owners' preferences of whether they want to completely eradicate parasites, or maintain low levels. Low levels may be the most ideal goal, as overuse of dewormers may lead to parasite resistance and more costly treatments. Results from this study suggested that in the mid-South region, an aggressive deworming program can prove effective. This is despite potential parasite resistance and a temperate climate which favors egg viability in the environment. However, a deworming program can be made more efficient by performing fecal tests on all horses to assess their need of treatment.

Appendix A. Results Tables and Figures

Table 4. Fecal egg counts for 12 horses at Barn A.

Horse ID	Age (Y)	Sex	BCS	Count x 25 before	Count x 25 after	Classification
Annie	7	M	5.5	0	0	low
Cheyenne	13	M	6	0	0	low
Duke	12	G	6	0	0	low
Flower	13	M	6	0	0	low
Jackson	6	G	6	0	0	low
Knight	9	G	4	0	0	low
Lady	13	M	5	0	25	low
Nick	22	G	4	0	0	low
Penny	13	M	5	0	0	low
Roany	17	G	6	0	0	low
Shebe	16	M	5	125	0	low
Spike	17	G	5	150	25	low

Figure 5. Fecal egg counts for 12 horses at Barn A.

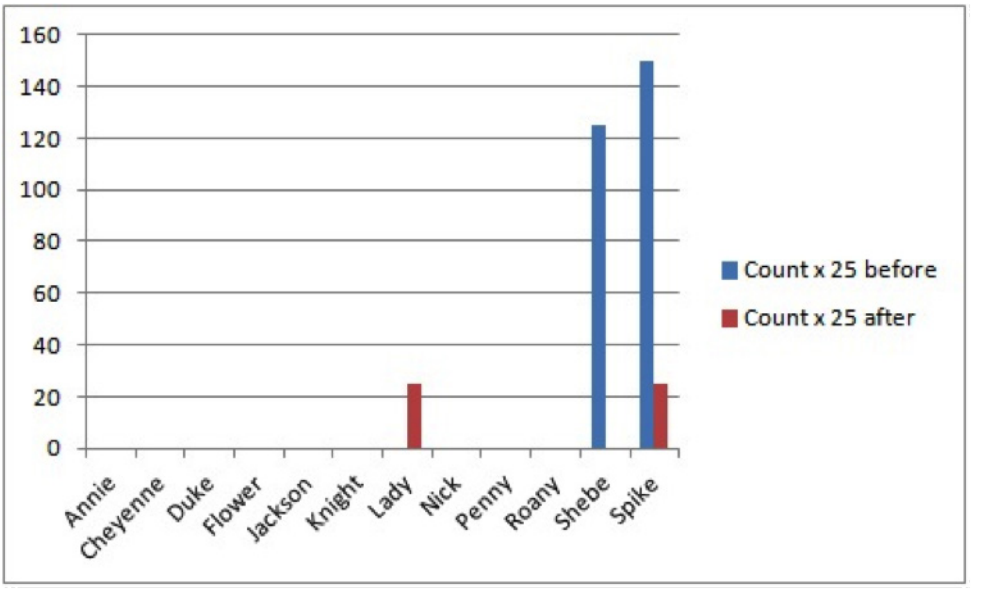


Table 5. Fecal egg counts for 20 horses at Barn B.

Horse ID	Age (Y)	Sex	BCS	Count x 25 before	Count x 25 after	Classification
Ava	5	M	6	1475	0	high
Butler	19	G	4	0	0	low
Calaway	18	G	6	0	25	low
Chandler	20	G	6	0	0	low
Doc	17	G	5	0	0	low
Embrace	4	S	5	2625	0	high
Gabe	12	G	5	0	0	low
Joggi	21	G	5	0	0	low
Lance	24	G	5	50	0	low
Lily	15	M	5	1125	0	high
Lincoln	27	G	5	0	0	low
Luigi	6	G	6	1200	0	high
Poppa	14	G	4	0	0	low
Raymond	9	G	6	0	0	low
Rusty	25	G	5	1500	0	high
Sally	12	M	6	0	0	low
Smokey	13	G	6	400	0	medium
Snickers	14	G	6	675	0	high
Tallulah	8	M	5	0	0	low
Tom	19	G	5	25	0	low

Figure 6. Fecal egg counts for 20 horses at Barn B.

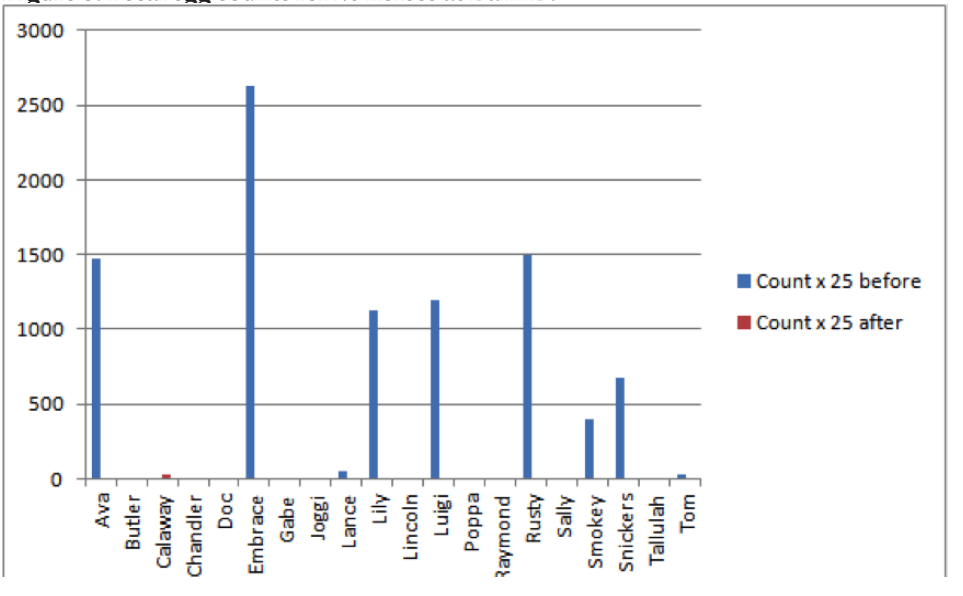


Table 6. Fecal egg count results for 5 horses at Barn C.

Horse ID	Age	Sex	BCS	Count x 25 before	Count x 25 after	Classification
Legs	10	M	7	500	0	high
Big Eddie	9	G	3	1750	0	high
Bonnie	6	M	6	550	0	high
Doo-dah	6	G	4	975	0	high
Little Eddie	9 mo	G	5	325	0	medium

Figure 7. Fecal egg count results for 5 horses at Barn C.

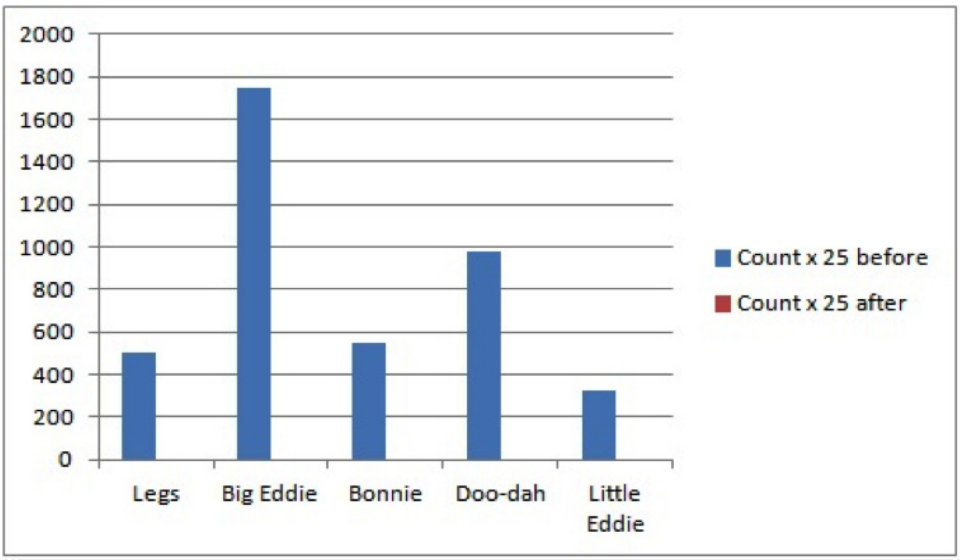


Table 7. Fecal egg count results for 8 horses at Barn D.

Horse ID	Age (Y)	Sex	BCS	Count x 25 before	Classification
Amadeus	4	S	8	1225	high
Alacrity	20	M	4	425	medium
Canyon	12	G	7	0	low
Kolita	17	M	6	25	low
Licorice	5	M	8	0	low
Penny	20+	M	4	500	high
Rootbeer	4	M	5	750	high
Ruffian	7	M	5	250	medium

Figure 8. Fecal egg count results for 8 horses at Barn D.

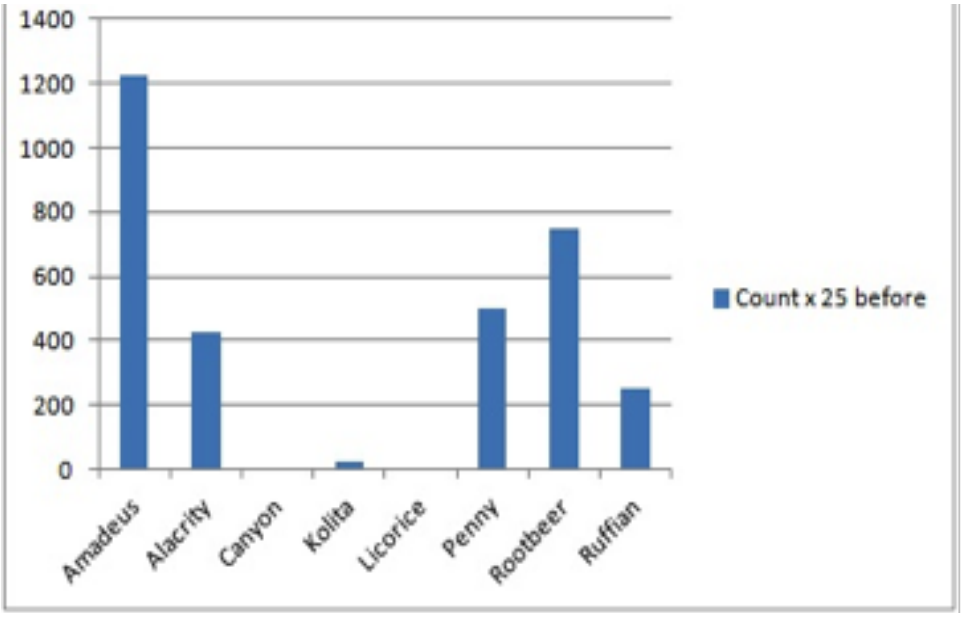


Table 8. Fecal egg count results for 10 horses at Barn E.

Horse ID	Age (Y)	Sex	BCS	Count x 25 before	Count x 25 after	Classification
Alias	16	M	4	0	0	low
Ariel	10	M	8	700	0	high
Bailey	14	G	8	0	0	low
Griffin	12	G	4	450	0	medium
Noa	12	G	4	0	0	low
Raene	8	M	6	950	0	high
Skip	13	G	6	100	0	low
Sugar	14	M	8	0	0	low
Toby	30	G	6	50	0	low
Tucker	9	G	6	375	0	medium

Figure 9. Fecal egg count results for 10 horses at Barn E.

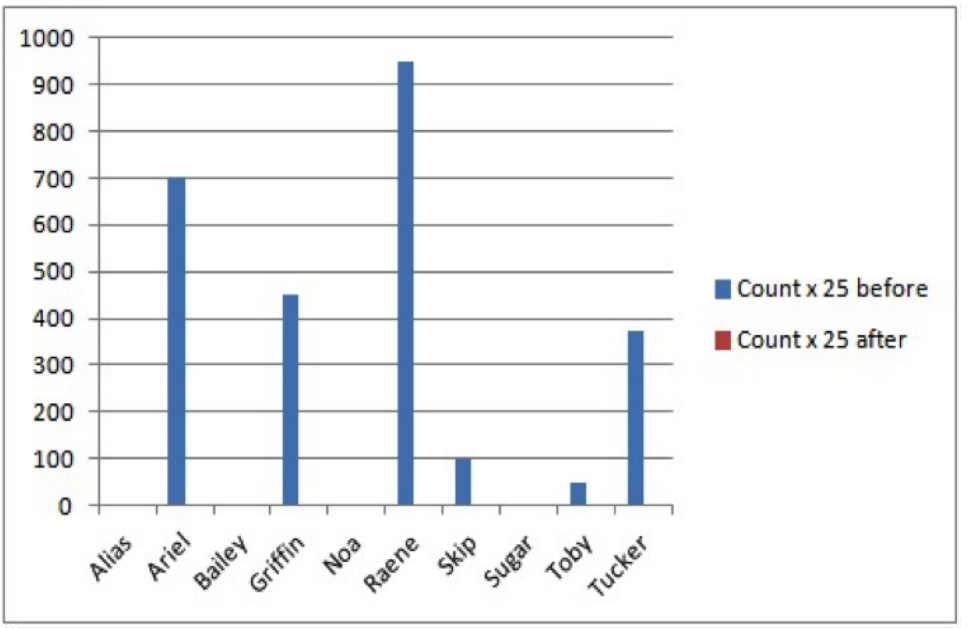


Table 9. Fecal egg count results for 5 horses at Barn F.

Horse ID	Age	Sex	BCS	Count x 25 Before	Count x 25 after	Classification
Dixie	11	M	8	1500	0	high
Dolly	15	M	6	100	0	low
Doobie	5	G	6	1500	0	high
Lacey	5	M	8	3225	0	high
Scout	9	G	8	150	0	low

Figure 10. Fecal egg count results for 5 horses at Barn F.

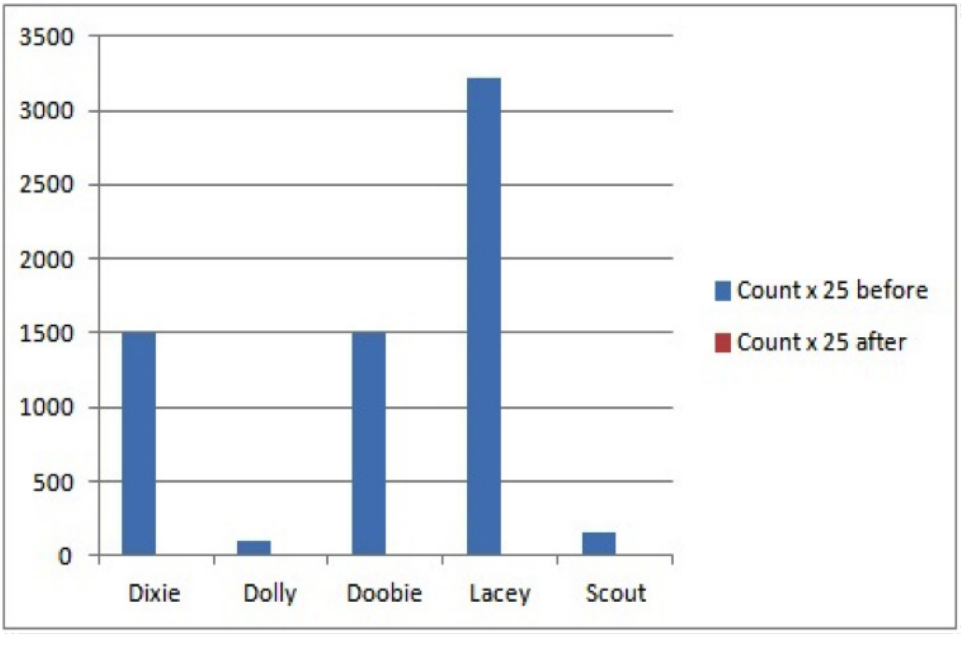


Figure 11. The number of horses for all barns vs. the percentage of these horses that tested positive for parasites

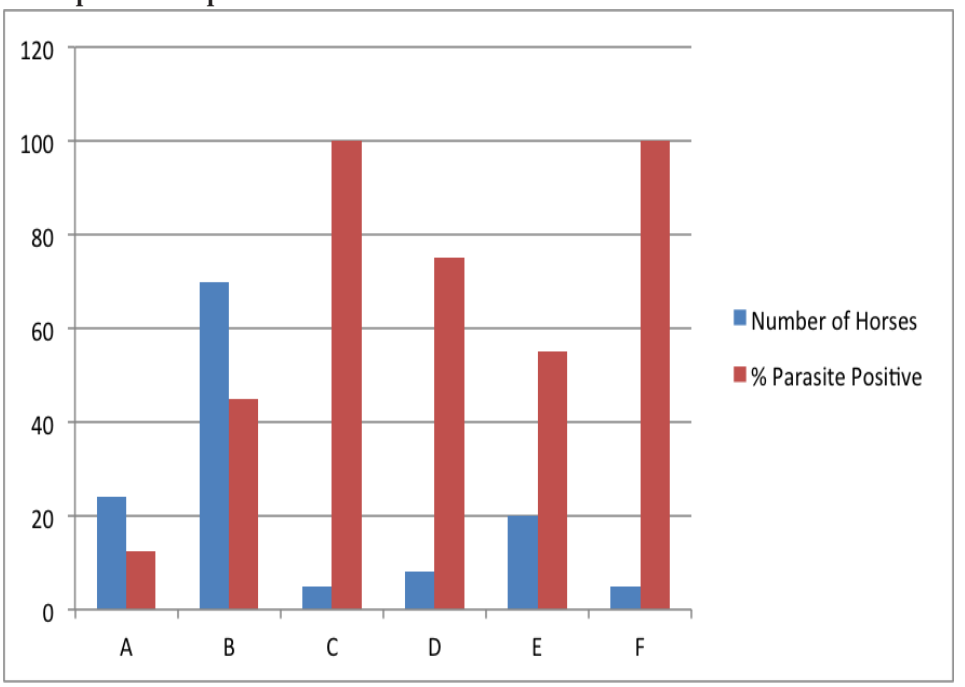


Figure 12. The average hours of turnout for horses in each barn vs. the percentage of these horses that tested positive for parasites

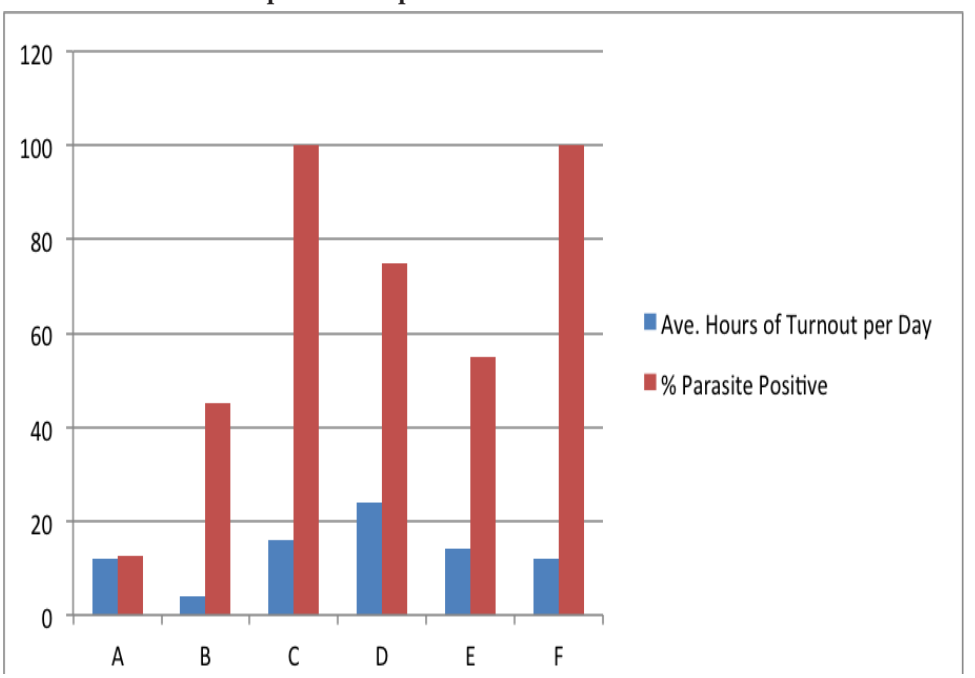


Figure 13. The average stocking rate in pastures for each barn vs. the percentage of these horses that tested positive for parasites

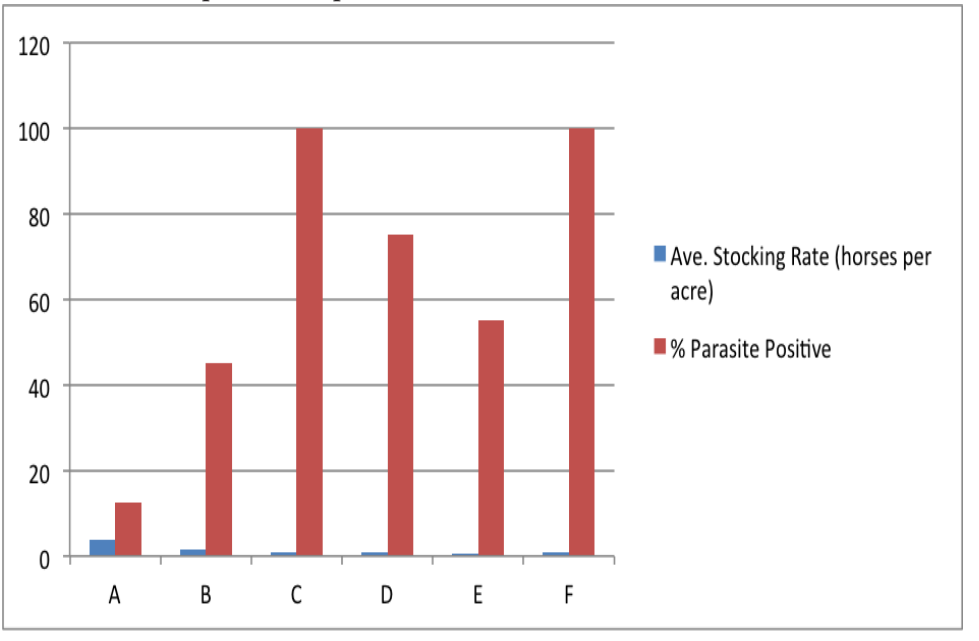


Figure 14. The frequency of deworming in each barn vs. the percentage of these horses that tested positive for parasites

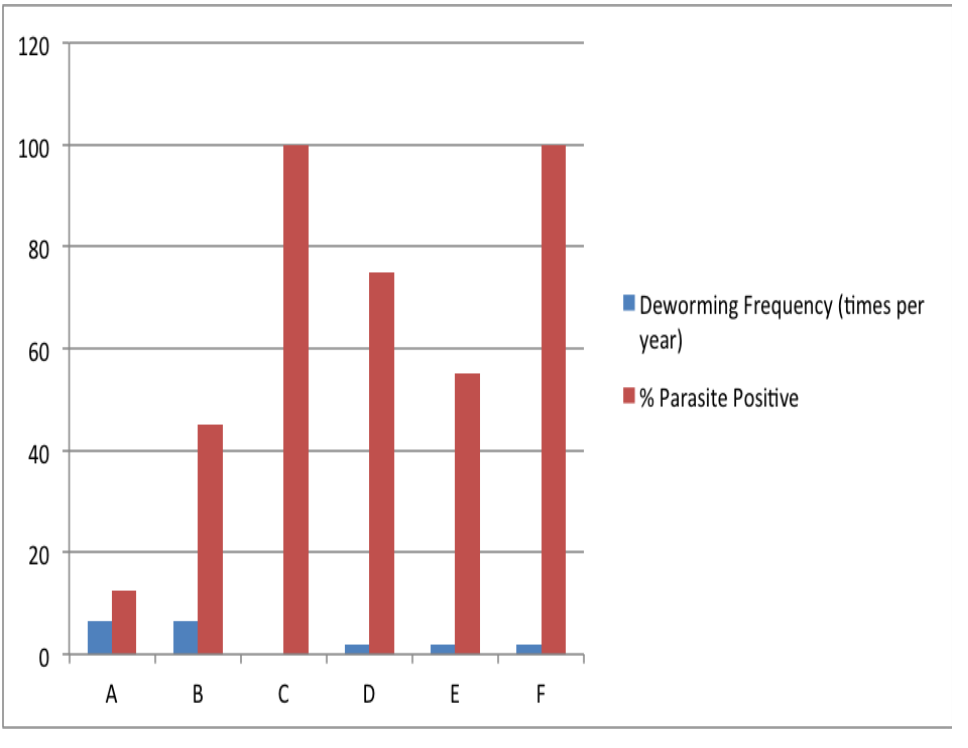


Table 10. Information about horse care procedures provided by Barns A-F

Barn	No. of horses	Turnout (hrs/ day)	Stocking rate (ave. horses/ acre)	Ever done FEC?	Manure Removal (pastures)	Frequency of Deworming	Products Used	Dosage
A	24	12	3.8	yes	no	8 week	rotate Ivermectin and Pyrantel Pamoate	1 tube per horse
B	70	2-6	1.5	no	no	8 weeks	Moxidectin, adding Praziquantel every 3rd deworming	1 tube per horse
C	5	16	1.0	no	no	never	n/a	n/a
D	8	24	1.0	no	yes	twice yearly	diatomaceous earth (mixed into feed)	
E	20	14	0.5	no	yes	twice yearly	rotate Ivermectin and Ivermectin plus Pyrantel Pamoate and Praziquantel	1 tube per horse
F	5	12	0.09	no	no	twice yearly	rotate Ivermectin and Moxidectin plus Praziquantel	1 tube per horse

Escaping Eden: Milton, Melancholy, and Radcliffe's Gothicism

Sarah Gray-Panesi

Abstract

Alison Milbank begins her article, "Milton, Melancholy, and the Sublime in the 'Female' Gothic from Radcliffe to Le Fanu" by establishing that the "emotional centre" of the Female Gothic "is melancholy, and its primary source Milton's 'Il Penseroso'" (143). However, neither Milbank, nor any other scholars examine the relationship between Milton's "Il Penseroso" and the Gothic. This paper explores one of the more pressing questions arising from Milbank's article: in precisely what ways does the influence of Milton's "Il Penseroso" manifest itself in Ann Radcliffe's novels? Milbank opens the door for such an examination with close readings of several of Radcliffe's poems interspersed throughout her first four novels; however, this essay picks up where Milbank leaves off by providing an examination of the scenes surrounding these poems to elucidate the extent to which Radcliffe's conception of melancholy depends upon Milton's. This project illustrates that while many of Radcliffe's scenes read as re-writings of Milton's Paradise Lost *and* A Mask Presented at Ludlow Castle, *they have their foundations firmly laid in the Companion Poems and especially in "Il Penseroso.".*

The moment Sandra Gilbert and Susan Gubar's pivotal feminist Gothic study *The Madwoman in the Attic* appeared in 1979, Milton studies experienced a sea change that continues to influence scholarship today. Gilbert's brazen attack on Milton's Eve in her chapter "Milton's Bogey: Patriarchal Poetry and Women Readers" inspired a number of articles and book length studies aimed at repairing the damage done to Milton by Gilbert's claim that he deliberately aligns Eve not only with Sin but also with Satan. [1] Gilbert's new "unholy trinity," appearing when feminist discourse itself came under fire, inspired decades of study, which still attempts to answer questions raised in Gilbert and Gubar's *Attic*, not the least of which is whether Milton was a misogynist, a philogynist, or simply a product of his times. [2] To say nothing of the doors opened for feminist Milton studies, though, Gilbert's chapter at the very least forced scholars to reconsider Milton's influence on later authors, both male and female. Their explorations—surely much to Gilbert's chagrin—discover a poet and polemicist whose several works were not only respected but also imitated, adapted, and alluded to in countless eighteenth-century and Romantic poems, plays, novels, and political texts.

Recognizing that scholars will likely never answer the question of Milton's misogyny, a significant body of criticism instead attempts to rehabilitate Eve—and Milton with her—via readings and analyses in response to *The Madwoman in the Attic*, while another body of criticism addresses Milton's "bogey" itself as Gilbert defines it: "a Word of power, and the Word is Milton's." [3] My study joins the latter group. By exploring the extent to which Milton was less a bogey than a benefactor, especially for authors such as Ann Radcliffe, who effectively built their aesthetic principles using Milton's poetry as a blueprint. Gilbert would have us believe Milton's very manuscripts acted as creative roadblocks not only for the nineteenth-century authors with whom her study is concerned, but also for eighteenth-century writers, and especially for women poets and novelists of both centuries. Gilbert claims that the "sensitive female reader" would have recognized the "shadowy" gestures toward "connections, parallels, and doublings among Satan, Eve, and Sin" in *Paradise Lost* and felt the "historical dispossession and degradation of the female principle," as well as the subsequent creative oppression elicited by Milton's epic.[4] However, even a cursory examination of Radcliffe's novels reveals she did not labor under the pall of Milton's

1 Sandra Gilbert and Susan Gubar, "Milton's Bogey: Patriarchal Poetry and Women Readers." *In The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination*. 2nd edition (New Haven: Yale University Press, 2000), 199. Though their book as a whole is a collaborative effort, Gilbert alone drafted the section, "Milton's Daughters," in which this chapter appears.

2 The Feminist Sex Wars occurring in the late 70s and early 80s resulted in polarized feminist views characteristic of third wave feminism. Gilbert remarks in her chapter that Milton was a "known misogynist."

3 Gilbert and Gubar, "Milton's Bogey," 192. Joseph Wittreich's *Feminist Milton* is a prime example of a response to Gilbert and Gubar's text. Gilbert notes early in her chapter that Virginia Woolf's journal contained an undefined reference to "Milton's bogey." This chapter is Gilbert's attempt at defining the bogey and how it influenced 18th-and 19th-century women writers.

4 Gilbert and Gubar, "Milton's Bogey," 199.

so-called bogey. On the contrary, Milton's presence in Radcliffe's fiction is salutary and inspirational, not only for her heroines, but also for her readers.

A few scholars already have begun examining Milton's influence on Radcliffe: Maggie Kilgour establishes Radcliffe's Female Gothic plot in *The Mysteries of Udolpho* as a retelling of Milton's *A Masque Presented at Ludlow Castle (Comus)*, Anne Williams outlines the same plot as a retelling of *Paradise Lost*'s "fortunate fall," and Alison Milbank gives Milton and *Paradise Lost* almost sole credit for inspiring Radcliffe's model for the Female Gothic heroine in all her novels. [5] However, when we consider that for the past two decades only a few book chapters investigate in any detail the relationship between Milton and Radcliffe, it becomes clear that this subject requires deeper scrutiny. The problem is not one of association; the problem is a lack of variety in association. The above studies are promising in that they point toward the importance of Milton's lyric poetry for Radcliffe's aesthetic, but they are also limiting in that they quickly retract such postulations in order to return focus to Milton's epic. It is only when we expand the scope of study to include Milton's shorter poetry, especially "L'Allegro" and "Il Penseroso," with their emphases on mood and landscape, that we can recognize the extent to which Milton inspires Radcliffe's fiction.

Admittedly, Radcliffe is more often aligned with Shakespeare than with Milton, which was often the case with eighteenth-century women writers, since Shakespeare, like most women at the time, was not formally educated. Also, in addition to receiving the moniker "The Shakespeare of Romance Writers" based on her tendency toward poetic landscape description, Radcliffe unapologetically mines Shakespeare's work for the bulk of her epigraphs. [6] While scholarly connections between Radcliffe and Shakespeare are thus easily explained, her connection with Milton requires significantly more study. Both connections, however, suffer from narrow readings privileging only a few works as possible influences for Radcliffe's fiction. In Milton's case, that influence is *Paradise Lost*. Annette Wheeler Cafarelli, though, is one of the first—and unfortunately one of the last—to recognize and explore what "is often noticed but never explained" about Radcliffe's relationship with Milton: "almost all of Radcliffe's many Miltonic mottos and quotations are taken from the shorter works. . . . But Milton's poem on the transgression of Eve is conspicuously absent from Radcliffe's program of references." [7] Why, then, this preoccupation with establishing Paradise Lost as primogenitor of the Gothic? Cafarelli suggests Wordsworth's "mistaken assertion" that *L'Allegro* and *Il Penseroso* were little known in the eighteenth century provides one possible explanation, but another more likely reason for this alignment arises from Radcliffe's reliance upon Edmund Burke's theories of sublimity and beauty in his

5 See Maggie Kilgour's *The Rise of the Gothic Novel* (1995), Anne Williams's *Art of Darkness* (1995), and Alison Milbank's "Milton, Melancholy and the Sublime" (1994) as well as her introduction to Radcliffe's *The Castle's of Athlin and Dunbayne* (1986 and 1995). Readers may note that these studies are somewhat dated; however, they do represent the most "recent" work on the topic at hand.

6 Nathan Drake provided this nickname in *Literary Hours* (1800).

7 Annette Wheeler Cafarelli, "How Theories of Romanticism Exclude Women: Radcliffe, Milton, and the Legitimation of the Gothic Novel," in *Milton, the Metaphysicals, and Romanticism*, ed. Lisa Low and Anthony John Harding (Cambridge: Cambridge University Press, 1994), 94.

Philosophical Enquiry (1757). Radcliffe discusses Burke's theories in the prologue to her posthumously published *Gaston de Blondeville* (1826). This prologue, which first appeared separately in the *New Monthly Magazine* under the title "On the Supernatural in Poetry," contains Radcliffe's only commentary on aesthetic theory:

> Terror and horror are so far opposite that the first expands the soul, and awakens the faculties to a high degree of life; the other contracts, freezes, and nearly annihilates them. I apprehend, that neither Shakspeare [sic] nor Milton by their fictions, nor Mr. Burke by his reasoning, anywhere looked to positive horror as a source of the sublime, though they all agree that terror is a very high one; and where lies the great difference between horror and terror, but in the uncertainty and obscurity, that accompany the first, respecting the dreaded evil?[8]

Here, Radcliffe places her three most prominent influences—Shakespeare, Milton, and Burke—in conversation with one another in order to comment on the importance of distinguishing between objects of terror and horror in poetry. To exemplify the differences between the two sensations, Radcliffe employs Milton's Satan, depicted in Book IV of *Paradise Lost* with "horror" on his brow, to explain that even though Milton chooses the term "horror," "his image imparts more of terror than of horror; for it is not distinctly pictured forth, but is seen in glimpses through obscuring shades."[9] This distinction not only establishes the importance of obscurity for Radcliffe's terror aesthetic but also gestures toward Burke's comments on obscurity in his *Philosophical Enquiry*. In fact, Radcliffe's aesthetic can be read as a response to Burke's theory of the sublime.

Burke establishes obscurity as the only means by which an object may become truly terrific and thereby achieve absolute sublimity. As long as a given object can be known to its fullest extent, can be seen clearly, it cannot be sublime. Burke illustrates his point using the darkness of night as his prime example of how otherwise mundane objects might inspire fear/terror when obscured from sight. Most importantly, Burke identifies Milton as the only writer who "understood the secret of heightening, or of setting terrible things . . . in their strongest light by the force of a judicious obscurity." [10]However, Burke employs the portrait of Death in Book II of *Paradise Lost* to ground his aesthetic theory:

> The other shape,
> Of shape it might be call'd that shape had none
> Distinguishable in member, joint, or limb,
> Or substance might be call'd that shadow seem'd
> For each seem'd either; black it stood as Night,

8 Ann Radcliffe, "On the Supernatural in Poetry," in *Gothic Documents: A Sourcebook 1700-1820*, eds. E.J. Clery and Robert Miles (Manchester University Press, 2000), 168.

9 Radcliffe "On the Supernatural," 169. Radcliffe's allusion refers to Milton's image of Satan in battle in *Paradise Lost*, Book: 4, lines 988-999, "His stature reacht the Sky, and on his Crest [brow] / Sat horror Plum'd." All references to Milton's work in this study are cited from *John Milton: Complete Poems and Major Prose*, ed. Merritt Y. Hughes (Cambridge: Hackett Publishing Company, Inc., 2003)

10 Edmund Burke, *A Philosophical Enquiry Into the Origin of Our Ideas of the Sublime and Beautiful*, ed. Adam Phillips (Oxford: Oxford University Press, 1990), 55.

> Fierce as ten Furies, terrible as Hell,
> And shook a dreadful Dart; what seem'd his head
> The likeness of a Kingly Crown had on.[11]

For Burke, Milton's image of Death is the ur-sublime. Rather than disagreeing with Burke, though, Radcliffe uses her discussion of Milton's Satan to prove that even when Milton employs the term "horror," he does so while leaving all other characteristics to the reader's imagination. But, unlike Burke, Radcliffe is not crafting new aesthetic theories; rather, she uses her prologue to expand upon an aspect of sublimity which Burke—ironically—allows to remain obscured: the contrasting roles that terror and horror play in eliciting or precluding sublimity. Radcliffe chooses Milton's depiction of Satan hemmed round by the Angelic Squadron because it places the reader outside the circle of angels, straining for a clear view of the "Spear and Shield" that Satan "seem'd" to hold.[12] Radcliffe's example safely separates the reader from Satan by an Angelic Squadron. This throws into contrast Burke's example, which provides no such barrier between the reader and Death. In short, Radcliffe subtly deploys Burke's own theories against him. In the most quoted section his *Philosophical Enquiry*, "Of the Sublime," Burke states, "When danger or pain press too nearly, they are incapable of giving any delight." [13]On the one hand, Radcliffe's tactical scene selection allows her to ensure she provides the distance necessary to achieve sublimity and, on the other hand, illustrates that she may understand Burke's aesthetic theory better than he.

Unfortunately, employing examples from *Paradise Lost* in "On the Supernatural in Poetry," tactical though they may be, establishes the epic as Radcliffe's prime source of Miltonic inspiration for many academics. Discussions of the above aesthetic theories are now central to any examination of Radcliffe's conception of sublimity, and scholars have continually allowed the examples Radcliffe uses to outline her theory—*Hamlet, Macbeth*, and *Paradise Lost*—to problematize connections with any other texts or authors. However, though Radcliffe establishes sublimity and its presence in these three works as a pivotal concern in her work, scholars must not fall prey to the assumption that these few directly referenced works are the only ones useful for further analysis. Furthermore, we must not allow such assumptions to preclude our attempts to engage with and analyze other aesthetic concerns within her work. Instead, the paucity of Radcliffe scholarship in general should have researchers battling for every opportunity to shed new light on her life and work.

The pitfalls for Gothic scholars of narrowly focusing on *Paradise Lost* become evident in such works as Alison Milbank's "Milton, Melancholy and the Sublime" and her introduction to Radcliffe's very little read and often forgotten first novel, *The Castles of Athlin and Dunbayne* (1798).[14] In both of these studies, Milbank establishes that the

11 Milton, *Paradise Lost*, Book: 2, lines 666-673.

12 Milton, *Paradise Lost,* Book: 4, lines 977-990..

13 Burke, *A Philosophical Enquiry*, 36.

14 Milbank is the only scholar to deal repeatedly and in any depth with Milton's influence on Radcliffe.

"emotional centre" of the Female Gothic "is melancholy, and its primary source Milton's 'Il Penseroso'":

> The goddess leads the poet first to contemplation in a garden, to a wilder landscape, to tales of tragedy and ancient chivalry, and lastly to 'the studious cloisters pale' of an ancient abbey, and a hermit's cell. This perambulation sets off the chain of associations between landscape, the medieval past and its religious architecture that will engender the Gothic novel, but it also defines a mood that will dominate eighteenth-century nature poetry of sad and solitary meditation. [15]

At this point in "Milton, Melancholy and the Sublime," Milbank notes that "Il Penseroso's" melancholy functions as a foundation for many of the most well-known Gothic writers, including Radcliffe.[16] However, she does not examine the relationship between "Il Penseroso" and the Gothic any further. Instead, she insists that even though "the word 'melancholy' only occurs a couple of times in *Paradise Lost*, the condition is one of the consequences of the Fall, so that the reader's attitude to the depiction of the delights of Eden is melancholic, since what is described has been lost."[17] Thus, having established this "connection" between the Gothic and Milton's epic, Milbank uses her theory of loss to add to the ever-growing library of psychoanalytic readings associated with Gothic fiction. She treats "Il Penseroso" as a model for the Gothic "mood" in a similar fashion in her introduction to *The Castles of Athlin and Dunbayne*. Here, Milbank opens with a Freudian/Kristevan psychoanalysis of the Gothic which, for her, proves Eden's presence as loss in Radcliffe's text and the Gothic in general. However, mid-study, she pauses to remind readers that Milton's "Il Penseroso" is the "common buried source" in the graveyard poets' twilight poems and therefore in the Gothic.[18] But Milbank quickly notes that even though "Il Penseroso" was vastly popular in the early eighteenth century, "so also was *Paradise Lost*, which also has some powerful evening scenes," and returns again to the Garden of Eden.[19] In these two studies—which unfortunately comprise the bulk of direct comparative studies between Milton and Radcliffe—we witness the back-pedaling required to maintain *Paradise Lost* as the primary source of Gothic melancholy.

While Milbank's and other scholars' seeming refusal to recognize Milton's "Il Penseroso" as a significant influence on Radcliffe is interesting, their work nonetheless establishes a foundation upon which to raise just such a project. Cafarelli, Milbank, Kilgour, and Williams provide a starting point. Kilgour, Cafarelli, and Milbank all recognize that the unnamed Lady of *Comus* almost certainly provides Radcliffe with her model for the

15 Alison Milbank, "Milton, Melancholy and the Sublime in the 'Female' Gothic from Radcliffe to Le Fanu." *Women's Writing* 1, no. 2 (1994), 143.

16 Milbank also points out the "Graveyard" poets—usually listed as Young, Thomson, Beattie, Gray, and Collins—as key influences for Radcliffe and the Gothic. A list which, when Shakespeare and Milton are added, covers the majority of poets Radcliffe quotes in her epigraphs.

17 Milbank, "Milton, Melancholy and the Sublime," 144.

18 Alison Milbank, Introduction to *The Castles of Athlin and Dunbayne*, by Ann Radcliffe (Oxford: Oxford University Press, 1995), xviii.

19 Milbank, Introduction, xviii-xix.

Female Gothic heroine.[20] Moreover, they each mention "Il Penseroso's" central role in establishing the Gothic's melancholic atmosphere.[21] Chloe Chard investigates this atmosphere and its debt to the graveyard poets and Milton in her introduction to Radcliffe's *The Romance of the Forest* (1791), noting that Radcliffe's allusions to such poems as Collin's "Ode to Evening" and Thomson's "Seasons" themselves gesture back even farther to their own legacy in Milton's "Il Penseroso." [22]

Contrasting Chard's introduction with Milbank's arguments in "Milton, Melancholy and the Sublime illustrates in greater detail the problems that arise from restricting Radcliffe's possible sphere of influence only to *Paradise Lost*. Unlike Chard, who examines several scenes and postulates several possible influences, Milbank explores one poem, "Stanzas," composed by Adeline, the novel's heroine, as she watches the sun set over a lake.[23] Milbank determines that the masculine sun descending into the feminine lake represents Radcliffe's retelling of Adam and Eve's sexual union as described in Book IV of *Paradise Lost*. However, while one may hear soft echoes of Eden when the lines are excised from the scene in which Adeline composes them, by replacing them in their proper context, the lines reclaim their associations with Milton's "L'Allegro" and "Il Penseroso" as Radcliffe almost certainly intended.

The scene in question focuses on Adeline as she explores the home of her new protector, La Luc. As Gothic heroines are wont to do, she rambles "alone through scenes, whose solitary grandeur assisted and soothed the melancholy of her heart."[24] Owing to La Luc's well-stocked library, Adeline frequently takes "a volume of Shakespear [*sic*] or Milton, and, having gained some wild eminence," sits beneath the trees and allows the breeze and "the visions of the poet to lull her to forgetfulness of grief."[25] During one of these solitary strolls, Adeline comes to a lake at sunset behind which sets a ruined castle in the mountains. A group of travelers sail in a pleasure boat on the water while one in their party plays a French horn. Listening to the music and watching the scene, Adeline finds herself inspired to compose the "Stanzas" to which Milbank refers:

> Now down the western steep slow sinks the sun,
> And paints with yellow gleam the tufted woods;
> While here the mountain-shadows, broad and dun,
> Sweep o'er the chrystal mirror of the floods.
> **********

20 Maggie Kilgour, *The Rise of the Gothic Novel* (London: Routledge, 1995), 138. Cafarelli, "Theories of Romanticism," 96. Milbank, "Milton, Melancholy and the Sublime," 150.

21 Indeed, it is not uncommon for studies involving Milton and Radcliffe to mention the relationship between "Il Penseroso" and Gothic melancholy in passing. However, none explores this relationship in close detail.

22 Chloe Chard, Introduction to *The Romance of the Forest* by Ann Radcliffe, ed. Chloe Chard (Oxford: Oxford University Press, 2009), xxii-xxiii.

23 Interspersing poetry in her novels was standard practice for Radcliffe, especially in *The Romance of the Forest* and *The Mysteries of Udolpho*.

24 Ann Radcliffe, *The Romance of the Forest*, ed. Chloe Chard (Oxford: Oxford University Press, 2009), 260.

25 Radcliffe, *The Romance of the Forest*, 261.

In the soft blush of light's reflected power,
The ridgy rock, the woods that crown its steep,
Th' illumin'd battlement, and darker tower,
On the smooth wave in trembling beauty sleep.
****
How sweat that strain of melancholy horn!
That floats along the slowly-ebbing wave,
And up the far-receding mountains borne,
Returns a dying close from Echo's cave!

Hail! Shadowy forms of still, expressive Eve!
Your pensive graces stealing on my heart,
Bid all the fine-attun'd emotions live,
And Fancy all her loveliest dreams impart.[26]

Returned to their proper context, Radcliffe's lines point directly to Milton's "Il Penseroso" in mood, and "L'Allegro" in subject. Granted, Milbank notes the similarities between Milton's "Towers and Battlements it sees / Bosom'd high in tufted Trees" and Radcliffe's battlement and darker tower; however, she focuses her attention on Milton's inclusion in "L'Allegro" of the word "bosom'd" in order to point toward a sexual reading of both Radcliffe's and Milton's poems.[27] To be sure, one notes a certain bawdiness in Milton's association of the "[b]osom'd" towers and battlements with a "beauty" who may lie within "[t]he Cynosure of neighboring eyes."[28] However, Milbank's attempt to establish the same sexual undertones in Radcliffe's "Stanzas" serves only to illustrate the problems that arise when scholars refuse to consider alternative influences for a given text.

It makes more sense that in a poem describing a landscape, the writer would turn to poetry of similar content for inspiration. The time of day and landscape, rather than recalling Adam and Eve's sexual union, recall the "twilight groves" of Milton's "Il Penseroso":

Thee Chantress oft the Woods among,
I woo to hear they Even-Song;
And missing thee, I walk unseen
On the dry smooth-shaven Green,
* * * * * * * * * * * * * * * * * *
Like one that had been led astray
Through the Heav'n's wide pathless way;
* * * * * * * * * * * * * * * * * *
Oft on a Plat of rising ground,
I hear the far-off Curfew sound,

26 Radcliffe, *The Romance of the Forest,* 262-263.

27 Milton, "L'Allegro," lines 77-78.

28 Ibid., lines 79-80.

Over some wide-water'd shor,
Swinging slow with sullen roar;
* * * * * * * * * * * * * * * * * *
There in close covert by some Brook,
Where no profaner eye may look,
Hide me from Day's garish eye,
* * * * * * * * * * * * * * * * * *
And the Waters murmuring
With such consort as they keep,
Entice the dewy-feather'd Sleep[29]

These selected lines from Milton's melancholy poem share too many similarities with Radcliffe's later "Stanzas" to be ignored. Both poems haunt the same liminal space between day and night in which the soft light plays upon water; both feature a far-off musical sound—Radcliffe's French horn and Milton's curfew bell—and both close with the image of waves lapping against the evening shore and lulling the pensive wanderer to restful sleep. Indeed, Adeline is even engaging in the same "wandering" as Milton's speaker in "Il Penseroso" when she finds the location that inspires her poem.

While examining the effects of de- and re-contextualization on Radcliffe's "Stanzas" is enlightening, exploring the remaining poems in Radcliffe's work proves equally interesting. Indeed, if we are searching for ready indices of Milton's melancholy in Radcliffe's fiction—and Milbank would have us believe she is—why would we not turn our attention to Radcliffe's poem "To Melancholy" ostensibly composed by her heroine Emily St. Aubert in her most well-known novel, *The Mysteries of Udolpho*? One need not read far into this composition to discover its Miltonic roots:

Spirit of love and sorrow—hail!
Thy solemn voice from far I hear,
Mingling with ev'nings dying gale:
Hail, with this sadly-pleasing tear! [30]

Radcliffe's invocation of the melancholy spirit echoes Milton's, even to the repeated "hail."[31] The scene that inspires Emily to compose these lines also recalls Milton's "Il Penseroso." As the novel nears conclusion, Emily wanders to the foot of a ruined watch-tower where her lover, Valancourt, would listen to her play her lute. On this particular evening, Emily ascends to the chamber at the top of the tower where she watches the sun set over the Pyrenees. While melancholy already saturates this scene—Emily believes her love has forsaken her for the more transitive pleasure of Paris and has come here to lament her loss—Radcliffe inserts a detail that undeniably connects this scene to Milton's "Il Penseroso." As Emily looks out of the tower, she sees not only the mountains in the

29 Milton, "Il Penseroso," lines 64-76.

30 Ann Radcliffe, *The Mysteries of Udolpho*, ed. Bonamy Dobree (Oxford: Oxford University Press, 2008), 663.

31 Milton, "Il Penseroso," lines 11-12. Invoking Melancholy, Milton writes, "But hail thou Goddess, sage and holy, / Hail divinest Melancholy."

distance, but also "the wood-tops beneath" her window. Situated in a "high lonely Tow'r" from which she calls upon the "lonely spirit" of melancholy to "awake thy lute" and "let thy song / Lead me through all they sacred haunt," Emily now embodies Milton's Penseroso.[32]

Admittedly, Radcliffe's "To Melancholy" rather blatantly imitates Milton's "Il Penseroso," but it also illustrates the level to which Milton influences Radcliffe's conception of melancholy. Once aligned with the speaker in Milton's poem, Emily calls upon the melancholy muse to guide her through "pathless" woods where "the cold moon, with trembling eye, / Darts her long beams the leaves between."[33] Further still, Radcliffe gestures toward Milton's "Even-Song" and "far-off *Curfew*," which his speaker hears during his wanderings as Emily hears the "dirges faintly swell . . . from the pillar'd cloister's cell" as well as the "sad chimes of vesper sound."[34] A heavy-handed imitation to be sure, but it would be difficult to construe Radcliffe's "To Melancholy" as anything other than an imitation of Milton's "Il Penseroso."

While Radcliffe's "To Melancholy" offers the most obvious allusion to Milton's "Il Penseroso," it is certainly not the only one in Radcliffe's oeuvre, nor does she restrict her allusions to the melancholy aspect of Milton's companion poems. As early as *The Castles of Athlin and Dunbayne*, readers hear echoes of Milton's "L'Allegro" in the poem "Morning," in which Radcliffe summons Aurora after the rising sun dispels twilight "And melts thy shadows swift away!"[35] And though Milbank chooses "Stanzas" from *The Romance of the Forest* to illustrate melancholy in Radcliffe's Gothic, Adeline's poem from the same novel, "Night," written as "the dusk came silently on, and the scene assumed a solemn grandeur" invokes the "Queen of the solemn thought—mysterious Night!" and determines, after the style of Milton's Prolusion "Whether Day or Night is the More Excellent," that night is better than day.[36] Further still, even as Radcliffe asserts the value of night over day in *The Romance of the Forest*, Emily declares in *The Mysteries of Udolpho*'s "To Autumn" that "more than mirth I prize" the melancholy tear shed remembering happier times, again echoing Milton's "Il Penseroso."[37]

Interestingly, while Radcliffe continues her practice of inserting epigraphs for each chapter in her final novel, *The Italian*, her heroine, Ellena, does not compose a single poem. Radcliffe does not cease her program of Miltonic allusions in this novel, choosing epigraphs from *Lycidas, Comus*, and "On the Morning of Christ's Nativity." However, she does seem to move away from associating anything but the mood of the piece with Milton's "Il Penseroso." Strangely, *The Italian*, Radcliffe's only novel written after she

32 Ibid, line 86. and Radcliffe, *The Mysteries of Udolpho*, 665-666.

33 Radcliffe, *The Mysteries of Udolpho*, 666.

34 Radcliffe, *The Mysteries of Udolpho,* 666.

35 Ann Radcliffe, *The Castles of Athlin and Dunbayne*, ed. Alison Milbank (Oxford: Oxford University Press, 1995), 93.

36 Radcliffe, *The Romance of the Forest*, 83-84.

37 Radcliffe, *The Mysteries of Udolpho*, 592.

had actually had the opportunity to see the scenery she had written about for so long, is conspicuously an "indoor" tale. Ellena spends the majority of the novel at the mercy of Radcliffe's most Satanic villain, Schedoni. Perhaps the most intriguing aspect of Radcliffe's *The Italian*, though, aside from directly confronting the "evils" of the Catholic Church and the Inquisition, is its repeated allusions to *Paradise Lost*. Perhaps coincidentally, *The Italian*, though it sold well, was also one of her least popular novels. But the mysteries of this novel are for another study.

Though this study questions scholars'—and especially Milbank's—tendency to imbue Milton's *Paradise Lost* with undue influence over Radcliffe's fiction, one must concede they do so for a laudable purpose: to help draw eighteenth-century women writers out from under the shadow of Milton's so-called bogey. Furthermore, rather than attempting to suggest that Radcliffe was not influenced by Milton's epic, this study hopefully illustrates the extent to which, as Milbank herself states, "Milton was important to literary women of the eighteenth century because of his status as a sublime poet, the very quality that *The Madwoman in the Attic* regards as a blockage to female creativity."[38] What scholars must remember, though, is that this sublimity manifested itself both in Milton's epic poetry and in his lyric poetry, and we will only begin fully to understand the extent of his influence on the Gothic when we expand the critical scope to include not only his epic, but also his shorter works. For Radcliffe, to whom landscape description became a poetry of its own, "L'Allegro" and "Il Penseroso" provided a much richer tapestry than *Paradise Lost* on which to paint her Gothic Garden of Eden.

38 Milbank, "Milton, Melancholy, and the Sublime," 144.

Bibliography

Burke, Edmund. *A Philosophical Enquiry Into the Origin of Our Ideas of the Sublime and Beautiful.* Edited by Adam Phillips. Oxford: Oxford University Press, 1990.

Cafarelli, Annette Wheeler. "How Theories of Romanticism Exclude Women: Radcliffe, Milton, and the Legitimation of the Gothic Novel." In *Milton, the Metaphysicals, and Romanticism.* Edited by Lisa Low and Anthony John Harding. 84-113. Cambridge: Cambridge U.P., 1994. 84-113. Print.

Chard, Chloe. Introduction to *The Romance of the Forest*, by Ann Radcliffe. Oxford: Oxford University Press, 2009.

Gilbert, Sandra and Susan Gubar. "Milton's Bogey: Patriarchal Poetry and Women Readers." In *The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination*. 2nd ed., 187-212. New Haven: Yale University Press, 2000.

Kilgour, Maggie. *The Rise of the Gothic Novel*. London: Routledge, 1995.

Milbank, Alison. Introduction to T*he Castles of Athlin and Dunbayne*, by Ann Radcliffe. Oxford: Oxford University Press, 1995.

---. "Milton, Melancholy and the Sublime in the 'Female' Gothic from Radcliffe to Le Fanu." *Women's Writing* 1, no. 2 (1994): 143-60.

Milton, John. "Il Penseroso." In *John Milton: Complete Poems and Major Prose*. Edited by Merritt Y. Hughes, 72-76. Cambridge: Hackett Publishing Company, Inc., 2003.

---. "L'Allegro." In *John Milton: Complete Poems and Major Prose*. Edited by Merritt Y. Hughes, 67-72. Cambridge: Hackett Publishing Company, Inc., 2003.

---. *Paradise Lost*. In *John Milton: Complete Poems and Major Prose*. Edited by Merritt Y. Hughes, 207-469. Cambridge: Hackett Publishing Company, Inc., 2003.

Radcliffe, Ann. "On the Supernatural in Poetry." In *Gothic Documents: A Sourcebook 1700-1820*. Edited by E.J. Clery and Robert Miles, 163-172. Manchester: Manchester University Press, 2000.

---. *The Castles of Athlin and Dunbayne*. Edited by Alison Milbank. Oxford: Oxford University Press, 1995.

---. *The Mysteries of Udolpho*. Edited by Bonamy Dobree. Oxford: Oxford University Press, 2008.

---. *The Romance of the Forest*. Edited by Chloe Chard. Oxford: Oxford University Press, 2009.