Can our anthelmintic strategy decrease internal parasites and improve animal performance in weaned beef calves?

Shane Hernandez, Graduate Student in Animal and Diary Science, UGA
Lawton Stewart, Extension Beef Cattle Specialist, UGA

Internal parasites, or worms, are a common problem impacting cattle that graze on pastures. When infected, animals may display visible symptoms such as: emaciation, diarrhea, and rough hair coat. However, sub-clinical issues may also occur which may impact animal performance such as a decrease in milk yield, weight gain, carcass characteristics, and fertility. These sub-clinical issues can cause significant economic impact to a production system because the effects are not always detectible to the "naked eye". Often the negative impact is not recognized until the damage is done, and profit is lost.

Anthelmintic products are available to help control internal parasites. When the strategy of pour-on dewormers was introduced in the 1990s, the practice was widely adopted because of the ease of use. Producers could apply the product directly to the cattle's back while it stood in a chute or alley. Over time, overuse and incorrect application have led to a potential resistance of internal parasites to these products. Other products, such as injectable dewormers and oral (white) dewormers, have not been used as extensively because of the increased time associated with these technologies.

A potential strategy to ensure larvae death of multiple parasite species is using two anthelmintics, with one being an oral (white) dewormer. However, minimal data is available to justify this strategy. Therefore, a project was conducted at multiple experiment stations within the University of Georgia system to evaluate the efficacy and animal performance of oxfendazole (oral, white dewormer), eprinomectin (pour-on), and a combination of both during a 42-day background phase.

This study utilized weaned calves across two years and cattle herds at four different University of Georgia research units (797 total calves) including Eatonton Beef Research Unit (Eatonton), Northwest Georgia Research and Education Center (Calhoun), Alapaha Range Station (Alapaha), and J. Phil Campbell Sr. Research and Education Center (Watkinsville). At each location, calves were weighed at weaning and stratified by weight, age, and sex into groups, and within groups, animals were randomly assigned into one of four treatments: 1) oxfendazole (Synanthic©, Boehringer Ingelheim, Duluth, GA), 2) transdermal eprinomectin (Eprinix©, Boehringer Ingelheim, Duluth, GA), 3) Both products (BOTH), and 4) the Control (CON) group who did not receive an anthelmintic treatment. Anthelmintic was applied per manufacturer recommendation, the transdermal eprinomectin was administered at 1ml per 10kg and oxfendazole was administered orally at 1ml per 50kgs. Each year, all cattle were weighed and fecal samples were collected from 10% of calves at the beginning (day 0) and day 14. Fecal egg counts (FEC) were assessed on all fecal samples. Cattle were weighed again on day 42 to evaluate animal performance.

The fecal egg count for day 0 and 14 are presented in **Figure 1**. An anthelmintic is considered effective if the total fecal egg count (FEC) reduction is above 95%. Across the four locations, all three anthelmintic strategies reduced FEC compared to the control. However, the ORAL and BOTH treatments showed the greatest reduction. In fact, the POUR treatment only resulted in a 65% reduction in FEC

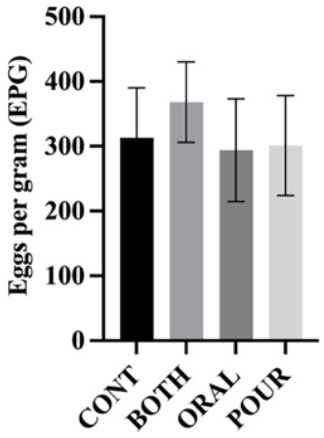

Figure 1a. Mean EPG count by treatment on d 0

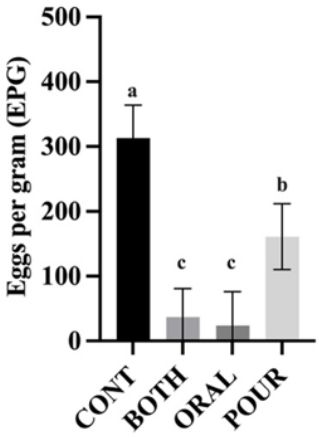

Figure 1b. Mean EPG count by treatment on d 14

ab: Means on d 14 without a common superscript differ (P < 0.05).
Data were collected from 320 fall-weaned calves (n = 320) at four different UGA research units were randomly assigned to one of four treatments: 1) oxfendazole (ORAL, Synanthic, Boehringer Ingelheim, Duluth, GA); 2) transdermal eprinomectin (POUR, Eprinex, Boehringer Ingelheim, Duluth, GA); 3) both anthelmintic treatments (BOTH); 4) the control (CONT) group who did not receive an anthelmintic treatment. Fecal samples were collected on d 0 prior to the treatment (a), and again on d 14 (b).

across locations, while the ORAL averaged 97% and BOTH averaged 99% reductions. This indicates that the POUR treatment did not provide an effective reduction in FEC compared to the ORAL and BOTH treatments. In other words, there were parasites not killed by the POUR treatment and therefore continued to shed eggs. This is likely due to the use of pour-on dewormers at all stations over the past 5-10 years and these parasites building resistance.

The animal performance data is presented in **Table 1**. Cattle receiving all anthelmintic treatments gained more weight compared to those not receiving anthelmintic over a 42-day weaning period. Interestingly, the calves receiving ORAL gained more than BOTH and POUR. The value of weight gain was calculated using a current price of $2.20, and the total value added takes in consideration the cost of the treatment. All calves increased in value compared to the control with the ORAL treatment providing the largest return proved.

If a production system has relied heavily on pour-on dewormers for several years, there can be an economic incentive to incorporate an oral "white dewormer" into their management system.This can improve profit, but can help reduce the chance for resistance parasites in their cow herd. For more information on dewormer strategies, and if you would like help implementing a dewormer program in your heard, contact your local Extension office (**1-800-ASK-UGA-1**); extension.uga.edu)

Table 1. Mean performance data1 from collected from recently weaned calves treated with one of four different anthelmintic strategies2 in 2019 and 2020 located at four different UGA research units

	Treatment			
	CONT	ORAL	POUR	BOTH
Initial Weight, lb	575	575	573	573
Final Weight, lb	600	613	606	608
Weight Gain, lb	24	37	33	35
ADG, lb/d	0.578	0.908	0.816	0.853
[3]Value of Weight gained, $	$52.80	$81.40	$72.60	$77.00
[4]Value of added with treatment cost included, $	$52.80	$79.94	$70.44	$73.38

ab: Means within a row without a common superscript differ (P < 0.05).
Data were collected on d 0 and d 42 from 797 (N = 797) fall-weaned calves located at four different UGA research stations.
2: Treatments included: i) oxfendazole (ORAL, Synanthic, Boehringer Ingelheim, Duluth, GA); ii) transdermal eprinomectin (POUR, Eprinex, Boehringer Ingelheim, Duluth, GA); iii) both anthelmintic treatments (BOTH); iv: the control (CONT) group who did not receive an anthelmintic treatment.
3: Value was calculated using a conservative value of $2.20 per lb gained.
4: Calulated using the average cost of each treatment: Drench = 1.46$, Pour on= 2.16$, Both = 3.62$