

# Antiparasitic resistance widespread in parasites that infect Arkansas cattle

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The effectiveness of antiparasitic products for cattle varies from pasture to pasture in treating parasite populations. Parasitologist Eva Wray helps Arkansas cattle producers pick the product and regimen to treat these

tiny pests.

"It's a different world," Wray said. "I tell my students it's like 'Horton Hears a Who!'—there's this whole world going on that we have no clue about."

For an ongoing research project, Wray, a post-doctoral research associate for the Arkansas Agricultural Experiment Station, the research arm of the University of Arkansas System Division of Agriculture, is testing the effectiveness of different classes for treatments of intestinal nematodes, more commonly known as worms.

"You want to know what your operation is susceptible to, what it's resistant to; that way, when you use a drug, you have more confidence that it's going to work," Wray said.

In addition to her research efforts, Wray teaches classes in the animal science department of the Dale Bumpers College of Agricultural, Food and Life Sciences at the University of Arkansas and works with the Cooperative Extension Services agents to relay important information to Arkansas producers.

## **Physical and financial health**

When [parasites](#) infect [cattle](#), the animals typically do not show obvious signs of distress, but the worms hinder an animal's performance, said Jeremy Powell, veterinarian and professor of animal science. Powell assisted Wray by administering dewormer treatments to the cattle and helped with sample collections.

Worms decrease feed intake and cause intestinal tissue damage and blood loss, Powell said. Those main effects can lead to decreased [weight gain](#), reduced body condition, lower reproduction performance,

decreased milk production—which can cause lower weaning weights—poor nutrient absorption and a compromised immune system.

"All of these negative effects lead to increased costs to the producer and cause poor productivity," Powell said.

Finding an effective deworming treatment can have a big impact on a producer's bottom line, Wray said. A successful deworming operation can help farmers earn as much as \$130 more per animal.

Deworming treatments can be expensive, but allowing parasites to persist can be more costly.

"Internal parasites touch just about every level of production and reduce its efficiency," Wray said. Whether producers are running milking operations or producing cattle for the feedlot, efficiently handling parasites streamlines the [production process](#) and ultimately leads to additional profit.

That's why choosing the right dewormer is so important, she said.

An ineffective worm treatment also leads to the parasites reproducing faster in a process called "compensatory responsiveness," Wray said. This process negatively impacts the affected animal and contaminates more of the pasture with parasitic larvae.

"In Arkansas, not everyone has the space to spread all of their animals out," Wray said, referring to the common practice of moving herds around different sections of pasture to break the infective cycle of the parasites. The larvae contaminating a section of pasture will eventually die off if no animals are present to carry the worms.

"Figuring out this puzzle is really vital to streamlining a producer's

operation," Wray said, "and I like to tell my producers it's more important to figure out what's not working than what is working."

## Slowing the growing resistance

Another aspect of Wray's research focuses on antiparasitic drug resistance. She hopes to help extend the effectiveness of common treatments in cattle operations.

In the sheep and goat industry, [antiparasitic drugs used to treat roundworms are becoming less effective worldwide](#), according to the U.S. Food and Drug Administration. Roundworms can prove fatal in sheep and goats.

The parasites affecting cattle, however, are not as deadly, Wray said. Cattle can also outgrow the effects of the parasites in a way that sheep and goats cannot.

"With cattle, it's more about money loss through decreased performance rather than animal death," Wray said.

Wray said limiting treatments to younger animals because of their increased susceptibility to parasites and using fecal egg counts to identify animals that need treatment extends the usability of a drug in cattle operations.

"Every time you use a dewormer, you're compounding resistance because you're not going to get 100 percent of any bug, especially worms," Wray said. "That surviving population is now resistant, they're putting out resistant eggs on the pasture, and each time you use a drug, that just compounds and multiplies."

## Drug resistance in Arkansas cattle

The results of Wray's research indicate that Arkansas parasites may be resistant to the macrocyclic lactone drug class, which includes ivermectin, cydectin and moxidectin, Wray said. The benzimidazoles, commonly referred to as "white wormers" due to their color, are still effective in Arkansas.

"We have found that drug class is still working pretty well," Wray said.

Notably, Wray said, the resistance to ivermectin in Arkansas is high, considering it was once considered a wonder drug.

When the patent for ivermectin ended and generic brands appeared on the market, Wray said the continued use of the product led to higher resistance to it in parasites.

"The overuse and misuse and lack of new products have just put us in a situation where we have extensive drug resistance, in cattle, especially in sheep and goats," Wray said. "In sheep and goats, we're approaching, in the United States, pretty much total drug failure, and we're not quite there with cattle."

### **A solution**

Wray recommends that operators consider doing a fecal egg count to determine the treatment threshold. The treatment threshold helps producers determine when it is economically advisable to treat an animal. The test also reveals if an operation's parasites are resistant to any [drug](#) classes.

Fecal egg counts can provide more information about animals than just

what parasites and parasite loads are present, Wray said. The egg counts can help with culling and breeding decisions because parasite tolerance and intolerance are genetically correlated.

"Parasites really wreak havoc on all of these physiological situations, so taking care of them really does help the entire health of your operation," Wray said.

Provided by University of Arkansas

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