

Overuse of deworming drugs led to widespread resistance among parasites

July 20 2012, By James Hataway

(Phys.org) -- A long forgotten foe is beginning to reemerge on pastures and meadows around the world, and farmers are finding that they have no way to combat it. Parasitic worms infecting cows, sheep, goats and horses are becoming resistant to the drugs used to kill them, and if changes are not made in how the few remaining drugs that still work are used, there may be no way left to fight the growing threat, according to Ray Kaplan, a University of Georgia professor in the department of infectious diseases.

Kaplan has studied drug-resistant [parasites](#) for years, and his findings recently published in the journal *Veterinary Parasitology* warn that the continued overuse of deworming drugs has the potential to create parasites that cannot be killed.

"We're already seeing the worst-case scenario playing out," Kaplan said. "In goats particularly, which have the worst problems with parasites and drug resistance, we quite frequently see farms that have [parasite resistance](#) to all de-wormers. Some of these farms reached the point where they no longer could control the effects of the parasites and decided to go out of business."

It wasn't always this way. Forty years ago when deworming drugs were widely adopted by farmers and ranchers, the new treatments looked like a simple solution to an age-old problem. Parasites typically do not cause severe illness or death, but they do make [animals](#) grow more slowly and produce less meat, milk or wool.

With the simple application of a drug, farmers were able to raise animals that were bigger, stronger and more productive. Veterinarians and parasitologists advised widespread use of the [new drugs](#) as a prophylactic. Rather than treating only the animals with heavy [parasitic infections](#) that were ill, farmers frequently started giving doses to all animals.

"It was like a golden age where all of a sudden the parasites that farmers have been dealing with for so long were gone," Kaplan said. "Our animals never looked better, they never produced better, and so it made sense to keep giving animals these drugs."

But as farmers reaped the benefits, parasites were slowly evolving immunity to the drugs. Eventually, the drugs stopped working, and farmers scrambled for new pharmaceuticals-or made cocktails comprised of several drugs to keep the worms at bay.

Kaplan worries that if the industry continues to overuse the few remaining drugs that still work, widespread resistance will decrease the profitability of raising livestock and force more farmers out of business.

To correct the problem, Kaplan says farmers must adjust their attitudes about parasites and make some fundamental changes to how they care for their animals.

"We're trying to change the paradigm of parasite control so that farmers are willing to accept a certain level of production loss in exchange for sustainability," Kaplan said. "We need to use less of these drugs and use them more intelligently and selectively."

The mere presence of parasites in an animal is no cause for alarm. In fact, it is something Kaplan would like farmers to view as natural and normal. Most animals have only low-level worm infections, so rather

than treating every animal to prevent the development of worms, Kaplan suggests reserving drug use only for those animals that develop large or dangerous infections. This will limit the number of parasites exposed to the drugs, and slow the development of resistance.

Kaplan also suggests changing the ways in which farmers allow their animals to graze. The [parasitic worms](#) live in the gastrointestinal tract of livestock and eggs and are passed in animal feces. The eggs hatch and develop into worm larvae, which then crawl onto the grass. Livestock become infected when they graze on the pasture and ingest the larvae.

If animals are allowed to graze freely on large, open pastures, they will naturally tend to favor some segments of the pasture more than others. As they congregate more in those areas, they come in contact with more fecal matter and, consequently, more parasites, he said.

A simple solution to this problem is to divide the pasture into segments with fencing and to periodically rotate animals to new grass. The new areas have fewer parasites, and many of the parasites left behind on old pasture will die naturally before the animals return.

"This decreases exposure," Kaplan said. "Although it's the same number of animals on the same amount of land, by rotating pastures, the animals are less exposed to the parasites and have less need for treatment."

These methods have proven successful in farms Kaplan has visited where parasite drug resistance was extremely high, and he hopes that they serve as an example to other [farmers](#) who might be hesitant to adopt the simple, more sustainable approach.

"If you use a drug to kill an infectious agent such as bacteria, viruses or parasites, eventually you probably will get [drug resistance](#)," Kaplan said. "But how rapidly that occurs, whether it occurs over several years or

several decades, will be determined by how the [drug](#) is used."

Provided by University of Georgia

Citation: Overuse of deworming drugs led to widespread resistance among parasites (2012, July 20) retrieved 16 June 2024 from <https://phys.org/news/2012-07-overuse-deworming-drugs-widespread-resistance.html>

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