PERCEPTIONS ON CATTLE PARASITE RESISTANCE

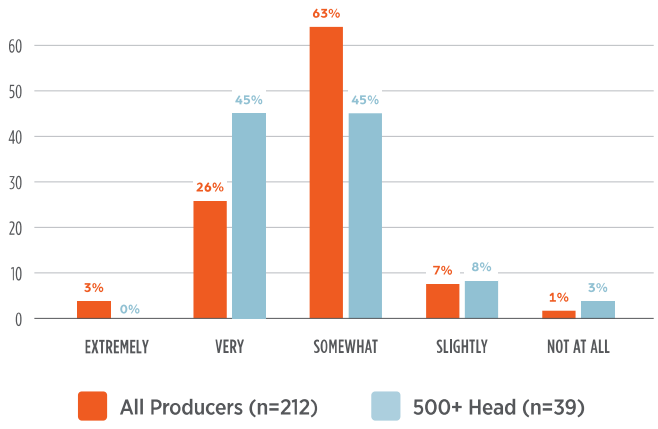
SURVEY SHOWS GAPS IN KNOWLEDGE AND LACK OF URGENCY

CATTLE PRODUCERS RECOGNIZE PARASITE RESISTANCE CONCERNS

A national survey[1] of beef cattle producers and beef cattle-focused veterinarians was conducted to understand awareness, experience, and level of concern about parasite resistance among producers and veterinarians. The survey also looked at parasite resistance identification and treatment plans and potential barriers, and opportunities to develop parasite control strategies.

While most producers and veterinarians perceive parasite resistance as a significant problem across the cattle industry, a majority of producers say they have a lack of knowledge regarding parasite resistance, with more than 70% rating themselves as "somewhat knowledgeable or less."

How knowledgeable are you in regard to parasite resistance?



KEY TAKEAWAYS

- ✓ Most cattle producers and veterinarians perceive parasite resistance as a significant problem across the cattle industry but feel they lack the information and tools to develop effective control programs.
- ✓ Producers express a lack of understanding about active ingredients used in different parasite control products and forms.
- ✓ Producers say their veterinarian is their go-to source of information about parasite resistance, followed by industry publications and websites.

Large producers (more than 500 head) say they are more knowledgeable, but only 45% called themselves "very knowledgeable." Larger producers perceive parasite resistance as a more significant issue than smaller producers do.

Cattle producers, regardless of operation size, say parasite resistance is a less significant issue in their own region than it is for the overall cattle industry.

VETERINARIANS CAN INFLUENCE PRODUCER PERCEPTIONS

While veterinarians and producers are on the same page for concerns about parasite resistance, veterinarians say producers need to do more and need more knowledge about parasite resistance. Veterinarians report producers:

- Do not take the problem of parasite resistance seriously
- Do not do enough to counteract parasite resistance
- Are not willing to spend time and money
- Are not knowledgeable on the topic of parasite resistance

Veterinarians say they raise awareness of parasite resistance with producers through discussions and the encouragement of fecal egg count reduction testing (FECRT), as well as emphasizing the importance of proper dosing and changing of antiparasitic drugs.

Besides encouraging producers to use FECRT, veterinarians said their discussions emphasize the importance of proper anthelmintic dosing and timing based on product labeling and government guidelines, as well as changing active ingredients in the products used.

In a separate focus group survey, veterinarians noted that producers typically contact veterinarians for acute illness issues or for medical/disease prevention. Veterinarians said it is their experience that producers will follow their recommendations the majority of the time, especially if the veterinarian can show how a recommendation can lead to an economic benefit.[2]

MORE PRODUCERS NEED TO ACT TO IDENTIFY RESISTANCE

According to the survey, only about 30% of producers have done anything to identify parasite resistance on their operations. Large producers were only slightly more likely to have taken steps to identify resistance.

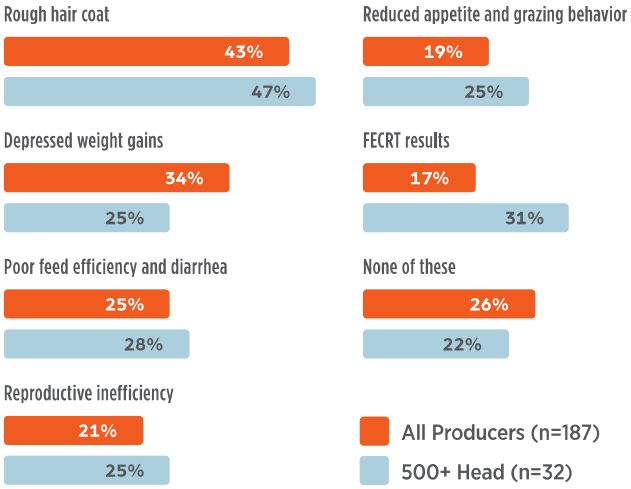
Likewise, veterinarians reported not regularly working with producers to identify parasite resistance, with almost half of responding veterinarians "sometimes" working with their producer clients on the issue.

That said, about half of producers have a plan in place to actively manage parasite resistance, and one-third reported having conducted FECRTs on their operation.

The symptoms most likely to convince producers and veterinarians to take action against parasite resistance include:

- Rough hair coat
- Depressed weight gains
- Reduced appetite/grazing behavior
- FECRT results
- Poor feed efficiency

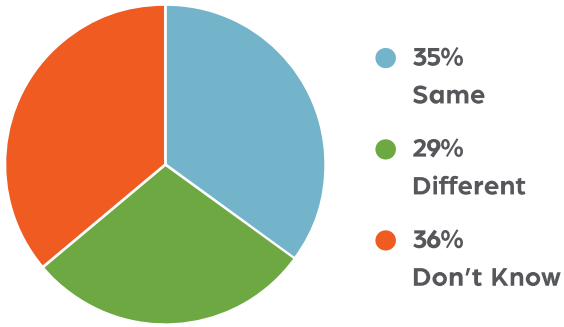
Select the issues, symptoms or results that convinced you to take action against parasite resistance.



DO PRODUCERS UNDERSTAND THE OPTIONS THAT ARE AVAILABLE?

There is confusion among cattle producers when it comes to understanding active ingredients used in different antiparasitic products and forms. When asked "Does a pour-on product and an injectable product with the same name have the same or different active ingredients?", nearly equal percentages of respondents answered: "Don't know," "Same" and "Different."

Does a pour-on product and an injectable product with the same name have the same or different active ingredients? (n=194)



Pour-on dewormer products are the most commonly used products in cattle producers' arsenal against parasites. Larger producers are more likely to use injectable products.

Continued

Cattle producers and veterinarians (about 70%) report changing among active ingredients each year, with about one-quarter of all survey respondents changing active ingredients every time an animal receives a second treatment. About 65% of veterinarians say they recommend selective treatment of cattle within a herd instead of mass-treating an entire herd.

However, there is a disconnect between producers and veterinarians in terms of using two different active ingredients at the same time (71% of veterinarians versus 17% of producers). In the separate focus group-based survey, producers were not aware of the practice of using multiple active ingredients at the same time.[2]

TIPPING POINTS EXIST FOR RESISTANCE-CONTROL PLANNING

About three-quarters of veterinarians provide a parasite control plan to their clients and about 75% of those plans actively manage for parasite resistance. There are veterinarians who don't currently provide parasite control plans, and their reasons include lack of producer concern and producers would rather pay for other veterinary services. Reasons why plans may not actively manage resistance include: the availability of parasiticide products and the inability to determine resistance with only FECRT results and no other readily available, cost-effective diagnostic tests.

Producers and veterinarians say their biggest barriers to identifying parasite resistance are:

- Lack of knowledge
- Lack of belief they have a problem
- Process to identify too expensive
- Lack of time to deal with the problem

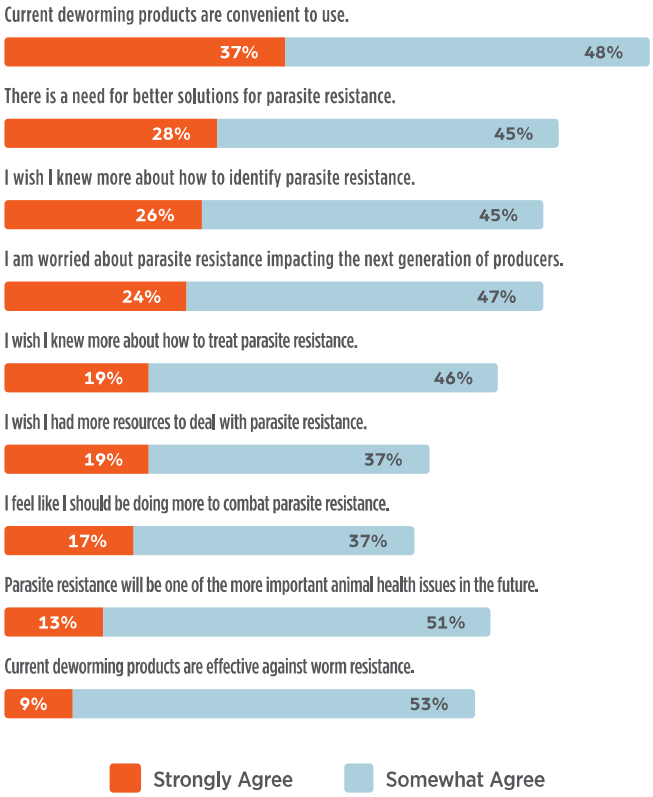
Cattle producers say they are likely to take action against parasite resistance when they see poor performance, get a recommendation from a veterinarian, become more educated on the topic, or notice an increased presence of lice and flies in their herd.

Producers say their veterinarian is their go-to source of information about parasite resistance, followed by industry publications and websites. Larger producers are much more informed by animal health company representatives than smaller producers.

RESISTANCE CONCERNS TO PERSIST IN FUTURE

Cattle producers believe deworming products are convenient to use but say there is a need for better solutions. They wish they knew more about how to identify and treat parasite resistance.

Please indicate your level of agreement with the following statements (All Producers=182)



Both cattle producers and veterinarians are concerned about parasite resistance affecting the next generation of cattle producers. In the survey, about 95% of veterinarians said parasite resistance will be one of the most important animal health issues in the future.[1]

Similar to producers, veterinarians want to know more about how to treat resistance and want better solutions to treat parasite resistance, with 94% of veterinarians strongly or somewhat agreeing with the statement.

FUTURE PARASITE CONTROL PROGRAMS MUST BE SUSTAINABLE

In the last 10 to 15 years, the incidence of resistant parasites has developed at a rapid and increasing rate. Future challenges include developing programs that control resistant parasites while at the same time result in more sustainable parasite control.[3]

Currently, one of the most effective means to slow the development of drug resistance is through the simultaneous use of multiple classes of anthelmintics, each of which has a different mode of action.[3] Another strategy to reduce the selective pressure on parasites is a targeted approach to drug treatments, where producers' needs are met by selectively treating different classes of cattle instead of blanket treatment at a location.[3]

HOW CAN PARASITE RESISTANCE BE MANAGED?

Internal parasite infections and external parasite infestations harm animal health and can result in significant production losses in food-producing species, such as cattle, sheep and goats.[4]

Antiparasitic animal drugs are used to treat and control parasites in animals. Parasites can develop resistance to these drugs, rendering the drugs less effective in controlling infestations. Resistance becomes a problem when an increasing percentage of a parasite population carries resistance genes, allowing the parasites to survive treatment with an antiparasitic drug that has been effective in the past.[4]

Factors that contribute to antiparasitic resistance include:

- Parasite biology, genetics and pathogenicity
- Immune status of host animal
- Treatment factors such as dose and frequency of dosing
- Drug factors such as mechanism of action and half-life (how long the active ingredient remains effective in a treated animal)
- Certain livestock management practices

The management practices that can contribute to resistance include:

- Underdosing an antiparasitic drug
- Frequent routine deworming without performing diagnostic tests or determining if treatment is necessary
- Treating every animal in the herd with the same active ingredient
- Deworming when environmental refugia is low
- Relying solely on antiparasitic drugs to control parasites rather than changing management practices such as adapting pasture management and grazing protocols to break reinfestation cycles

WHAT IS THE FECAL EGG COUNT REDUCTION TEST?[4]

The most common on-farm test to detect antiparasitic resistance is the fecal egg count reduction test (FECRT), a practical, widely available test to evaluate the effectiveness of antiparasitic drugs in the field.

To conduct an FECRT, fresh fecal samples are collected from a proportion of animals in a herd just before treatment with an antiparasitic drug and again after treatment (generally about 14 days, depending on the drug). Parasite eggs are counted in both the pre- and post-treatment fecal samples.

In 2020, Kaplan recommended the following conservative interpretation of FECRT results:

- Greater than 95%: effective, no evidence of resistance
- 90% to 95%: reduced efficacy, suspected resistance
- 80% to 90%: reduced efficacy, resistance is likely
- Less than 80%: ineffective, resistance is highly likely

Because the level of resistance varies from farm to farm, not all operations will have the same percentage reduction in post-treatment egg counts after treatment with the same drug. For this reason, percentage reductions should be compared over time on the same farm, and between-farm comparisons are not valid even for neighboring operations. If repeated FECRTs on the same farm show a consistent decline in reduction (e.g., 98%, 96%, 91%), resistance may be developing even though the values are greater than 90%.

There are limitations to the FECRT in cattle, including:

- Cattle shed fewer parasite eggs as they age.
- Cattle-specific parasites generally reproduce less frequently and produce fewer offspring than small ruminant-specific parasites.
- Cattle manure has a higher water content, which dilutes the concentration of parasite eggs.
- Other factors that can influence egg counts are gut fill, time of day, forage-passage rate, etc.

It is recommended that producers work with their veterinarian to interpret FECRT results and to develop a parasite control plan. ■

References

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2 Zoetis and Farm Journal, Parasiticides Research In-depth Interview Recap. November 2020.

3 Gasbarre LC. Anthelmintic resistance in cattle nematodes in the US. *Vet Parasitol.* 2014;204 (1-2):3-11.

4 U.S. Food and Drug Administration. Helpful Information for Veterinarians. Antiparasitic Resistance in Cattle and Small Ruminants in the United States: How to Detect It and What to Do About It. 2013, rev. 2015.

5 Kaplan RM. Biology, Epidemiology, Diagnosis, and Management of Anthelmintic Resistance in Gastrointestinal Nematodes of Livestock. *Vet Clin North Am Food Anim Pract.* 2020;36:17–30.