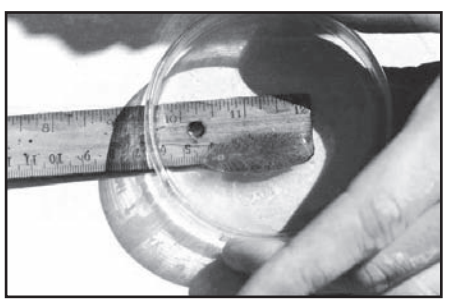
Enemy Within

Experts warn that liver flukes are not something to ignore if you want to remain in the cattle business.

Story & photo by
ED HAAG

While the economic consequences of liver flukes on juvenile cattle may appear minimal, calf producers should not ignore the parasite. Long after that calf has been shipped to the feedlot, its mother could face a liver fluke-induced health crisis of her own. The effects can be significant. In addition to liver damage, decreased reproductive performance, diarrhea, weight loss and jaundice, flukes can precipitate life-threatening secondary bacterial infections such as blackleg and Redwater.

William Foreyt of the department of veterinary microbiology and pathology at Washington State University is well aware of the effect a liver fluke infestation can have on a cattle herd. He warns that ignoring the parasite could cost a beef producer his livelihood. One study Foreyt and colleagues participated in involved a cow-calf herd in southern Idaho that was severely infested — 200 flukes per animal.



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"The liver flukes eventually put that rancher out of business," Foreyt says. "It can be that much of a problem."

Other reasons why today's calf producers should be concerned about the economic effect of flukes relate directly to the practice of retained ownership and the emerging trend among ranchers to graze their animals longer to offset higher finishing costs associated with feedlots.

While 20 years ago most cow-calf operations sold their calves to stockers and feedlots in the late fall, today, a growing number are retaining ownership through harvest. A 1996 study showed that while there were no significant economic losses in cattle infested with young flukes, that changed dramatically as the flukes matured and migrated from the digestive tract into the liver and bile duct. In untreated cattle that retained adult liver flukes — 40 to 140 liver flukes — the rate of gain was reduced from 8% to 28% when compared with healthy animals of a similar age.

John Maas, cooperative Extension veterinarian at the University of California–Davis School of Veterinary Medicine, is particularly concerned about the secondary bacterial infections that are able to establish themselves in organ tissue initially damaged by fluke activity. He adds that one of the most prevalent of these opportunistic soilborne pathogens is *Clostridium haemolyticum*. If allowed to establish itself, it is the direct cause of bacillary hemoglobinuria, more commonly known as Redwater.

It is believed that *C. haemolyticum* spores are capable of residing for long periods in the liver of healthy cattle without any evident effect on their health. The liver fluke, through its activity, establishes anaerobic conditions that are favorable to the bacteria, allowing the spores to germinate and proliferate. As this occurs, toxins are produced that attack red blood cells and compromise other organ systems.

"Once it starts, it happens very quickly," Maas says. "The animal's health deteriorates rapidly and ends in what appears to be sudden death."

Symptoms of Redwater can range from blood present in the nostrils, mouth, rectum and vagina to bloat caused by internal hemorrhaging and the presence of excessive amounts of abdominal and thoracic fluid. The disease derives its name from the dark red urine present in the bladder.

The Alberta Veterinary Surveillance Network (AVSN) in Canada has documented seasonal increases in the incidence of Redwater in late summer and fall that coincide with larval fluke migration through the liver. This supports the view that fluke activity in an animal is instrumental in creating an environment conducive to Redwater.

Maas notes that another problem relating to liver flukes is decreased fertility in heifers and cows. A Louisiana State University study conducted in 2003 found heifers treated for both worms and liver flukes weighed the most and had the best body condition scores (BCS) at pregnancy-check. They also had significantly higher pregnancy rates than either control heifers or heifers that were only dewormed.

Simply put, this means the longer ranchers retain infested animals without proper treatment, the higher their fluke-related losses.

A growing problem

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One indication of this is the fluke-associated liver condemnation rates reported by the U.S. Department of Agriculture (USDA). From 5% in 1973, the condemnation rate has been steadily climbing. The 2000 National Beef Quality Audit (NBQA) reported that the percentage of beef livers condemned because of flukes had risen to an all-time high of 21.7%

Furthermore, the most recent USDA surveys tracking the demographics of fluke infestations indicate the parasite is expanding its territory. Flukes were found in 18 states in 1994. The number of states reporting flukes in cattle had grown to 23 by 2000. Today, liver flukes are endemic in 26 states and believed to be establishing themselves in several more.

This means that geographically liver flukes are expanding beyond traditional hot spots, such as the Gulf States — especially Florida — the Pacific Northwest and portions of the Rocky Mountains, into the central states of Oklahoma, Nebraska and Kansas, as well as much of California. In fact, the incidence of flukes is so high in California that Maas makes a point of noting that very few beef cattle harvested in California are free of liver flukes.

"Our condemnation rate in this state is 90%," he says. "That is a real indication that the liver fluke is here to stay."

Follow the snail

To understand why the liver fluke has been so successful in expanding its territory, one must look at its life cycle, Maas says. Cattle become infested by ingesting young flukes that have attached themselves to blades of grass. These flukes then move through the intestinal lining and eventually find their way into the animal's bile duct and liver, where they deposit their eggs. The eggs are then shed into the manure and onto the ground where they hatch and infect freshwater snails. It is through the snails that the flukes find their way onto the blades of grass so they can start the cycle all over again.

So what is causing this broad expansion of the liver fluke's habitat? Experts believe it can be attributed to two factors: On a local level, flukes can be spread from herd to herd through the water that is reused in flood irrigation. On a national level, the organism is spread from state to state through the shipping of infected cattle and contaminated hay.

Maas adds that once the fluke is established, it is particularly difficult to control liver fluke populations in southern-tier states like California, because winters are not severe enough to kill the adult snails that act as intermediate hosts for fluke larvae. "In those northern states it gets cold enough to kill off all the adult snails," he says. "In those states the snails don't overwinter."

Control measures

During the last two decades, a great deal of the information disseminated on flukes relates directly to timely treatment of infected animals with proven drugs. Although researchers agree that this approach is the most effective, ranchers should do their best to prevent their cattle from becoming infested in the first place.

Foreyt notes that the low-lying riparian areas that provide on-site sources of water for cattle also harbor moisture-loving snails and the flukes that rely upon them for their transmission cycle.

By creating an alternative water source on higher ground and restricting access to the transmission hot spots, a beef producer can go a long way to breaking an infection cycle. "Snails are the intermediate host," he says. "If you can keep your cattle out of the swamps and wet areas, you will have few or no infections."

He notes that areas that use flood irrigation are also highly susceptible to liver fluke infestation.

When it isn't possible to prevent cattle from grazing fluke-infested fields entirely, rotating animals out of areas with known snail populations during the primary infection season can reduce the chances of cattle becoming infected. Maximum transmission of flukes occurs in spring and summer in warmer regions and late summer to fall in cooler regions.

Treat and rotate

Both Foreyt and Maas recommend any liver fluke control program include a regimen of recognized treatments. Three formulations are currently recommended for the treatment of liver flukes: Clorsulon, which is sold alone as Curatrem® or in combination with ivermectin as Ivomec® Plus, and albendazole, which is sold as Valbazen®.

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Maas notes that two out of the three flukacides on the market are sold in combination with other deworming products. "This makes it relatively easy to deal with everything at once," he says, adding that the beef producer has the option of a wash or an injection depending on the product being administered.

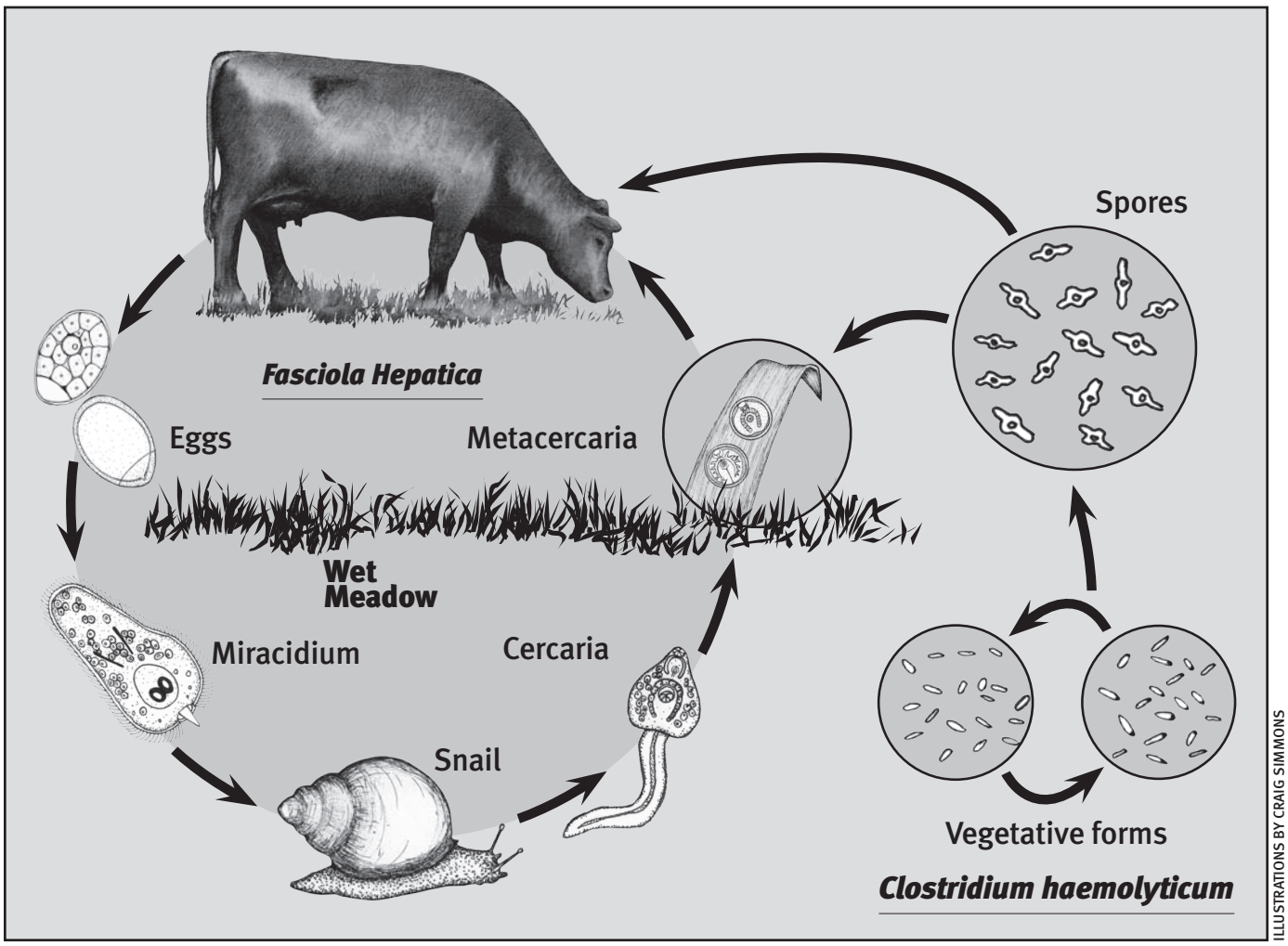
It is recommended that beef producers consult with their local veterinarian to determine the best regimen and treatment for liver flukes in their area.

Foreyt stresses the importance of timing when administering these drugs. "In the Northwest, we recommend late fall treatment because most of the transmissions occur in September and October," Foreyt says. "Because these drugs work better on adult flukes than juveniles, we suggest re-treating to get them all."

Because Maas' fluke control strategy involves a climate where snails are not winter-killed, he says it is critical that cattle are treated every time they are moved into what has been determined to be a fluke-free pasture in order not to infect the ever-present snail population.

"It is very important to routinely get rid of the flukes in your cattle before they go out on clean pasture so the snails don't become a part of its life cycle," Mass says.

Fig. 1: Life cycles of the liver fluke *(Fasciola hepatica)* and *Clostridium haemolyticum*



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