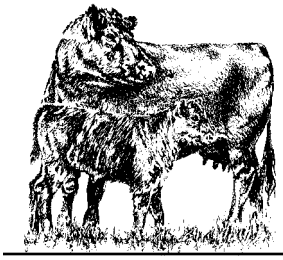

Western Beef Resource Committee *Fourth Edition*

Cattle Producer's Handbook

Animal Health Section 688

Liver Fluke Prevention for Cattle

Dr. Bill Kvasnicka, DVM, Ron Torell, and Dr. Ben Bruce, DVM
University of Nevada, Reno

Liver flukes are considered to be an important parasite of cattle grazing in the northwestern coastal area of the United States, especially in lowlands and river bottom pasture areas. The presence of liver flukes in this part of the country has been well documented, although the amount of economic loss caused by flukes, in terms of lost production, has never been properly identified.

Since these parasites invade a vital organ, however, their overall importance to an infected animal is seldom questioned. The main area of concern to most producers raising cattle on fluke-infested pastures is how can these parasites best be controlled.

The common liver fluke, *Fasciola hepatica*, is the main fluke found in cattle in the Northwest. The life cycle of the common fluke has been well studied and in general terms is fairly predictable. The first ingredient necessary to allow the flukes to survive is the presence of an intermediate snail host (only *Lymnea* snails are susceptible) along with sufficient moisture during most of the year to sustain the snail's presence.

The pattern of infection appears to coincide with the snail's life cycle as well as the fluke's life cycle. The combined cycle begins with the presence of a mature fluke in a parasitized animal, laying eggs that pass out in the manure, hatch, and infect a snail (if present). As winter approaches, these infected snails escavate into the mud and hibernate underground for the winter. In the spring, as the soil temperature rises, the snails emerge, release the immature flukes that encyst on the vegetation along the water area.

As the spring moisture recedes the encysted flukes become available to the cattle as they graze near the water areas. As summer approaches and the water areas dry up, most fluke transmission stops. The ingested immature flukes, however, continue development to maturity in the animal's body. This process of maturity development takes approximately 3 months before developing to adult flukes, which begin to lay eggs starting the transmission cycle all over again.

Since live fluke transmission occurs only in the wet areas of a pasture in fluke endemic regions, keeping cattle away from these areas when possible is the best method of control. Most cattle producers cannot afford to do this, therefore, treatment of liver flukes at a strategic time when the flukes are first susceptible to treatment but before these flukes have matured and begun laying eggs is the next best method of control.

Strategic control of the common liver fluke is possible by timing treatment to break the life cycle and eliminate the flukes before they mature fully and shed eggs back on the pasture (Fig. 1). Strategic treatment, therefore, is designed to both treat existing infections as well as to prevent future transmission of the parasite.

After the recent introduction of effective flukicides on the cattle market, producers have spent millions of dollars to control the common fluke with questionable results. Flukes appear to be as prevalent and economically important today as they were 10 years ago.

The reason for this continuing problem is that most of the "de-fluking" effort has been applied at the wrong time of year. Because "de-fluking" is often combined with the treatment of other parasites, these products are traditionally given in late fall when most producers are treating their cattle for stomach and intestinal worms. Late fall is too late in the season for effective liver fluke control. Unfortunately, the best time to strategically kill liver flukes is not the same as it is for other types of parasites.

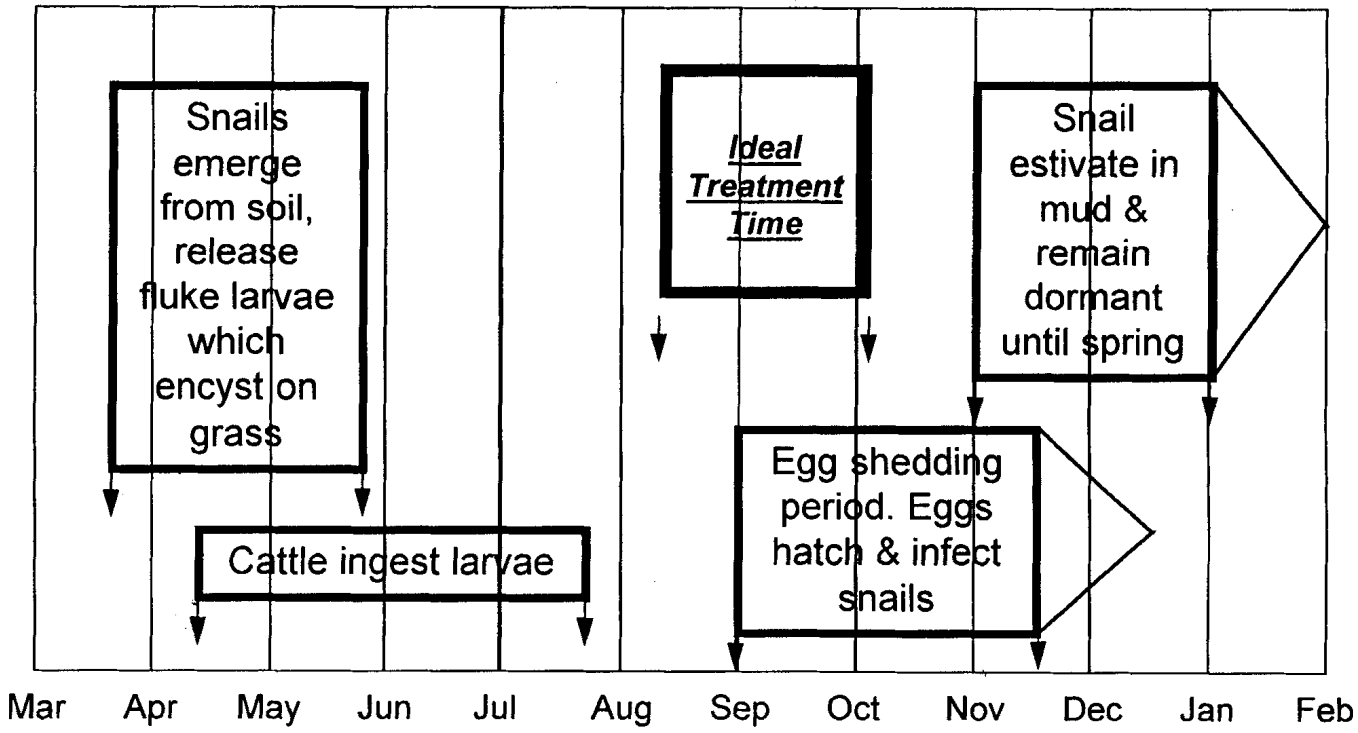

Fig. 1. Northwest seasonal liver fluke cycle.

Another problem with the current flukicide products is that none of these products are effective against the immature fluke during the early part of the migration cycle. Most researchers agree that during this early part of the migration cycle economic loss is the greatest and that by the time the flukes reach the age when the flukicides are effective, most of the damage caused by the flukes has already occurred.

For treatment to be successful, the flukes should be killed as soon as a majority of the invading flukes are sufficiently mature to be killed by the flukicide of choice, but before the flukes are mature enough to shed eggs. In most cases, the timing of this treatment should occur in early September depending upon the product used. If treatment occurs much later, reinfection of the pasture (and snails) will occur. If treatment occurs before this, treatment will most likely be ineffective and the reinfection process will continue uninterrupted.

A second issue affecting treatment success is that cattle acquire liver fluke infections over the spring and early summer period. These cattle, therefore, will harbor a wide range of larval stages that will be present at the time of a later summer treatment. Strategic treatment at this time is critical to ensure success, however, which product is used becomes important. If the flukicide used only kills liver flukes that are mature, larval stages will be missed by the treatment. If treatment is delayed until all larval stages are of sufficient age to be susceptible to treatment, the older flukes will begin laying eggs and spoil the pasture during this waiting period.

A third issue affecting treatment success is that a non-handling formulation of fluke treatment is currently not available. This means that producers who wish to strategically treat their cattle for flukes must work their cattle in order to administer the treatment. Since late August or early September is not a normal cattle working time, many producers may not take the necessary time or effort to provide proper treatment.

Control Measures

The product with the best efficacy for strategic fluke control has been identified to be clorsulon (Curatrem® - Merck) given at the recommended dose of 7 mg/kg body weight, which is reported to be effective against fluke larvae slightly less than 50 days old. Ivomec-Plus® (Curatrem® 2 mg/kg plus Ivomec® 0.2 mg/kg Merck), on the other hand, contains less than one-third dose of clorsulon and is reportedly only effective against mature flukes greater than 90 days old; as is albendazole (Valbazen® 10 mg/kg Pfizer).

A full dose of clorsulon will kill developing larvae about 30 to 35 days sooner than either albendazole or Ivomec-Plus®. Products such as Valbazen® and Ivomec Plus®, therefore, will not work as well as full dose Curatrem® in a strategic fluke control program.

The use of a product to kill flukes should not be confused with a product's ability to kill other parasites (as is the case of Valbazen® and Ivomec Plus®) since gastrointestinal parasites and external parasites such as lice, flies, ticks, and grubs in cattle all have different

life cycles and, thus, different times when they can best be treated.

As treatment programs become more specialized, the "least cost, most effective treatment" is to apply specific treatments for a specific type of parasite (such as liver flukes). If these specialized products are given strategically at the optimum time to break the parasite's life cycle, the end result will ultimately be the prevention of future infections and, thus, the prevention of economic loss to the producer.

Developing better diagnostic techniques to allow producers to easily identify fluke infected animals should be a priority to the agricultural scientific community. Also, the pharmaceutical industry needs to identify and develop more effective products that kill early developing flukes as well as to provide convenient dosage formulations for the flukicide products to allow producers to conveniently administer treatment in a timely manner.

Editor's Note: Reference to a company or trade name does not imply approval or endorsement by the authors.

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, by the Cooperative Extension Systems at the University of Arizona, University of California, Colorado State University, University of Hawaii, University of Idaho, Montana State University, University of Nevada/Reno, New Mexico State University, Oregon State University, Utah State University, Washington State University and University of Wyoming, and the U.S. Department of Agriculture cooperating. The Cooperative Extension System provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws.

Fourth edition; December 2016 Reprint