INTRODUCTION

Most cattle producers recognize that internal parasite infestation can damage their livestock. Treatment with one or several dewormers is commonly applied. Too often deworming occurs when it is convenient or when the cattle are being handled. Production benefits may result from such treatment. However, treatment is being applied after the cattle have been infected and the damage caused by internal parasites has occurred.

INTERNAL PARASITE EPIDEMIOLOGY

Internal parasite worm eggs are shed on the pasture or range by infected cows and calves. The eggs survive cold weather and drought, subsequently hatching when warm moist conditions exist. Cattle are infected, or re-infected, with internal parasites by ingestion of larva that develop from the hatching worm eggs. The larva develop into adult worms in four to six weeks and the female worms begin shedding additional eggs onto the pasture. Thus cattle grazing pastures or rangelands contaminated with parasite eggs are infected and continue to shed eggs during the grazing season. Therefore, cattle grazing pastures or rangelands contaminated with parasite eggs are infected and continue to shed eggs during the grazing season. The result is sub-clinical parasitism and in some cases clinical parasitism.

Parasitic infections are often more obvious in young animals than in older animals. However, older animals can be damaged by internal parasites especially during stress periods such as lactation, breeding, or during times of the year when nutrition is inadequate. In addition, older animals serve as a source of infection for the younger more susceptible animals. Sub-clinical production losses are manifested by lower weaning weights, lower conception rates, and by a reduction in weight gain for stocker cattle and replacement heifers.

PREVENTION OF INTERNAL PARASITES

A basic beef cattle production program should be designed to prevent diseases by strategic administration of vaccines and medications. Internal parasitism can be prevented by timely administration of modern dewormers. The key to preventing internal parasites in cattle is to prevent pasture contamination.

Prevention of pasture contamination

1. Deworm cattle in late fall or before grazing commences with a dewormer that effectively kills the adult worms and the developing larva.

2. The cattle will become re-infected by ingestion of larva hatching from the eggs that contaminated the pasture during the previous season. As previously mentioned, within four to six weeks the grazing cattle start shedding eggs and re-contaminate the pasture.

3. Secondary pasture contamination is prevented by deworming stocker cattle four weeks after grazing commences. Deworm beef cows and calves six weeks after grazing is initiated. Some newer dewormers claim persistent activity. This persistent activity has not been verified in the field. If the claim is accurate, timing for the second deworming could be extended. Read the label and consult with an animal health advisor to determine the proper timing.

Because it requires gathering and handling the herd, producers have been hesitant to administer a second deworming. An effective dewormer, formulated in free choice mineral or in a block, is available that can be self fed. The second treatment can be administered without gathering the cattle.
STRATEGIC DEWORMING

The term in common use for preventing nematodes in beef cattle by stopping pasture contamination is strategic deworming. A strategic deworming program must be outlined specifically for each ranch and for each cattle management plan. To design a plan a rancher or consultant should consider the following questions.

- When does the grazing season (grass growth) start and end?
- Will pasture rotation occur or will the cattle be moved from private land to a grazing allotment?
- What is the stocking rate?
- Are the pastures or meadows irrigated?
- What class of cattle will be grazing the pasture or range?
- What type of dewormer will be used and when should it be administered?
- What is the efficacy of the dewormer against the common nematodes?
- What is the dose, method of administration, and duration of action of the dewormer chosen?
- What is the cost of the dewormer and the cost of administering the medication?

AVAILABLE DEWORMERS

Dewormers are manufactured as pour-ons, injectables, drenches, pastes, boluses, blocks, feed for top dressing, mineral mixes, and as feed additives for mixing in feed or mineral (Table 1).

EFFECTIVE USE OF DEWORMERS

Type I dewormers are effective only on adult parasites. Type II dewormers control adults and the developing larva. In addition, Type II dewormers also control the inhibited stages of internal parasites. If a Type II dewormer is strategically applied, harmful levels of internal parasites will be prevented. When internal parasitism has been reduced to a safe level producers need not be concerned about treating for inhibited forms or nematodes.

Timing of treatments is critical if a strategic deworming program is to be successful. Review the section about Prevention of pasture contamination on the first page of this paper to determine when the cows, calves, or stocker cattle should be treated.

If all animals grazing a pasture are free of worms at the start of grass growth (either through fall or winter deworming), they will not need to be dewomed again until the developing larva have matured into egg laying female worms. The life cycle takes three weeks in calves, four weeks in yearling cattle, and six weeks in adult cattle. The number of mid-summer treatments depends on the length of the grazing season and the duration of action claimed by the manufacturer of the dewormer being used.

SHOULD BEEF COWS BE DEWORMED?

Healthy adult cows usually harbor small numbers of parasites. They develop an immunity to prevent a heavy parasite infection level. Cows may not appear to be infested, but in most trials, cows treated with dewormers will wean heavier calves than untreated cows.

Beef cattle producers should deworm their cowherd. Prevalence studies show that most cows in the Western United States harbor GI nematodes. Visual appraisal would indicate that the cows did not need treatment, but calf-weaning weights indicate otherwise. Cows produce large quantities of worm egg laden manure resulting in pasture contamination. Failure to treat the cows means that the calves pick up and harbor production-limiting levels of nematodes. This accounts for the differences in weaning weights. Split pasture trials attest to the cost benefit of deworming beef cows in the Western United States.

SUMMARY

The objective of strategic deworming is to reduce parasite challenge by lowering parasite numbers on the pasture and inside the animal. Prevention, rather than treatment, should be a rancher’s goal.
Table 1: Summary information about available dewormers (Cost*)

<table>
<thead>
<tr>
<th>GROUP</th>
<th>CLASS</th>
<th>BRAND NAME FORM</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ALBENDAZOLE</strong></td>
<td>Class II</td>
<td></td>
<td>Broad spectrum of nematodes, lungworms, mature liver flukes, plus heads &amp; segments of tapeworm. Do not administer to female cattle during first 45 days of pregnancy or for 45 days after removal of bulls. Retreatment may be needed 4-6 weeks after administration.</td>
</tr>
</tbody>
</table>
| | | Valbazen® (Suspension) Drench | • Withdrawal: 27 days.  
• Cost: $$$ |
| | | Valbazen® Paste | • Withdrawal: 27 days.  
• Cost: $$$ |
| **DORAMECTIN** | Class II | | For treatment of GI roundworms, lungworms, grubs, lice, and mange mites. |
| | | Dectomax® Injectable | • Duration of action: 21 days.  
• Withdrawal: 35 days.  
• Cost: $$$$$ |
| | | Dectomax® Pour-On Pour-on | • Duration of action: 28 days.  
• Withdrawal: 45 days.  
• Cost: $$$$$ |
| **EPRINOMECTIN** | Class II | | Broad spectrum for GI roundworms, lungworms, grubs, biting & sucking lice, mange mites, and horn fly. |
| | | Ivomec® Eprinex™ Pour-on | • Can be used during wet weather.  
• Duration of action: 21 days.  
• Withdrawal: Zero days.  
• Cost: $$$$$ |
| **FENBENDAZOLE** | Class II | | Broad spectrum control of GI roundworms including *Nematodirus* and lungworms. Kills tapeworms at double dose. Retreatment may be needed 4-6 weeks after administration. Following treatment cattle shed non-viable eggs for only 12-24 hours. |
| | | Panacur® Safe-Guard® Drench | • Ready to use.  
• Withdrawal: 8 days.  
• Cost: $$ |
| | | Panacur® Safe-Guard® Paste | • Ready to use.  
• Withdrawal: 8 days.  
• Cost: $$ |
| | | Safe-Guard® En-Pro-Al® (Medicated deworming supplement block) Block | • For deworming pasture cattle. Cattle do not need to be gathered and handled for treatment.  
• Feed for 3 days as sole source of salt.  
• Withdrawal: 11 days.  
• Cost: $$ |
| | | Safe-Guard® Sweetlix® Blocks (Natural protein deworming block) Block | • For deworming pasture cattle. Cattle do not need to be gathered and handled for treatment.  
• Feed for 3 days as sole source of salt.  
• Withdrawal: 11 days.  
• Cost: $$ |
| | | Safe-Guard® (free choice mineral) Mineral | • For deworming pasture cattle. Cattle do not need to be gathered and handled for treatment.  
• Feed for 3 to 6 days as sole source of salt.  
• Withdrawal: 13 days.  
• Cost: $$$ |
| | | Safe-Guard® (Top dress pellets) Oral feed | • Top dress in bunk or mix in feed on the farm. Cattle do not need to be gathered and handled for treatment.  
• Withdrawal: 13 days.  
• Cost: $$$ |
| | | Safe-Guard® 1.96% Scoop Dewormer (Type B Medicated Feed) Oral-feed | • For on the farm mixing or top dressing, no FD-1900 required. Cattle do not need to be gathered and handled for treatment.  
• Withdrawal: 13 days.  
• Cost: $$$ |

*Cost: Estimated cost per 1,000 pounds of body weight excluding the cost of external parasite treatments.

$-------- $1.80 to $2.10  
$-------- $2.10 to $2.50  
$$-------- $2.50 to $3.75  
$$$-------- $3.75 to $5.00  
$$$$-------- $5.00 to $6.50  
$$$$$-------- $6.50 or more  
Continued
<table>
<thead>
<tr>
<th>GROUP CLASS</th>
<th>BRAND NAME</th>
<th>FORM</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVERMECTIN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ivomec®</td>
<td>Injectable</td>
<td>Broad spectrum, controlling most GI roundworms, grubs, mange, some lice (depending on form), and lungworms. Treated cattle shed viable eggs for 3-5 days following administration.</td>
</tr>
<tr>
<td></td>
<td>Ivomec® Plus Ivermectin+Clorsolon</td>
<td>Injectable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ivomec® Pour-On</td>
<td>Pour-on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ivomec® SR Bolus (Sustained release bolus)</td>
<td>Bolus</td>
<td></td>
</tr>
<tr>
<td>DORAMECTIN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dectomax®</td>
<td>Injectable</td>
<td>For treatment of GI roundworms, lungworms, grubs, lice, and mange mites.</td>
</tr>
<tr>
<td></td>
<td>Dectomax® Pour-On</td>
<td>Pour-on</td>
<td></td>
</tr>
<tr>
<td>LEVAMISOLE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Levasole® Tramisol®</td>
<td>Injectable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Levasole® Tramisol® (Cattle Wormer Boluses)</td>
<td>Boluses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Levasole® Tramisol® (Soluble Drench Powder)</td>
<td>Drench</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Totalon®</td>
<td>Pour-On</td>
<td></td>
</tr>
<tr>
<td>MORANTEL TARTRATE</td>
<td></td>
<td>Feed Premix</td>
<td>Eliminates major adult internal parasites. May require re-treatment in 2 to 4 weeks.</td>
</tr>
<tr>
<td>Class I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rumate® (Medicated Premix 88)</td>
<td>Feed Premix</td>
<td></td>
</tr>
</tbody>
</table>

*Cost: Estimated cost per 1,000 pounds of body weight excluding the cost of external parasite treatments.

$--------- $1.80 to $2.10  
$$-------- $2.10 to $2.50  
$$ $2.50 to $3.75  
$$ $3.75 to $5.00  
$$ $5.00 to $6.50  
$$ $11.50 or more
<table>
<thead>
<tr>
<th>GROUP CLASS</th>
<th>BRAND NAME</th>
<th>FORM</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>
| OXFENDAZOLE | Synantic® (9.06% drench)       | Drench                | • For oral drenching.  
• Withdrawal: 7 days  
• Cost: $$$.

Synantic® (22.5% drench)  
Drench or Intraruminally  
• Administer orally by accurate dose syringe or into the rumen with Syntex Rumen Injector.  
• Withdrawal: 7 days.  
• Cost: $$$.

Synantic® (Bovine dewormer paste))  
Paste  
• Paste for oral use.  
• Withdrawal: 11 days.  
• Cost: $$$.

*Cost: Estimated cost per 1,000 pounds of body weight excluding the cost of external parasite treatments.

$-------------- $1.80 to $2.10
$$------------- $2.10 to $2.50
$$$------------ $2.50 to $3.75
$$$$---------- $3.75 to $5.00
$$$$$--------- $5.00 to $6.50
$$$$$$------- $6.50 or more