



Did You Know...

Significant reduction in *E. coli* concentration can be achieved by rotating cattle out of a pasture to allow several days of rest from grazing prior to irrigation?

By Theresa Becchetti

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PREVENTING DAMAGE FROM LIVER FLUKES

Hopefully, we will have a wet and warm spring this year to fill up the reservoirs and get the grass going. One of the potential problems with weather like this is that liver flukes can be very active. Just the thought of these creatures makes you a little bit uneasy. The idea that a microscopic creature on a blade of grass can end up as a large parasite in the liver of your cattle sounds like something out of a science fiction novel. However, that is just what happens on a continual basis in most all of California. Very few beef cattle slaughtered in California are free of liver flukes. The common liver fluke of cattle, *Fasciola hepatica*, does have this bizarre life cycle. The cattle ingest grass with an encysted stage of the fluke present. After the cattle eat this contaminated grass, the juvenile flukes "burrow" through the lining of the intestine, escape into the peritoneal cavity (the inside of the abdomen) and migrate to the liver. The flukes bore their way into the liver and over the next 6 weeks or more make their way to the interior of the liver and finally arrive in the bile ducts where they begin to lay eggs. The fluke eggs are shed into the manure of the cattle. These eggs hatch and make their way to fresh water snails, which they infect and undergo additional development. They eventually emerge from the snail as young flukes and encyst (form a resistant coating) on blades of grass. When cattle ingest them, the life cycle can be completed.

What damage do flukes cause? This is a common question, since such a high percentage of our cattle in California have liver flukes. The young flukes cause quite a lot of damage as they migrate through the liver. If only a few flukes are migrating through the liver at one time, the damage to the cattle is minimal. However, if many flukes are migrating at the same time, the damage to the liver can be extensive. In these cases, diarrhea, weight loss, and jaundice (yellow mucous membranes) can be observed. In addition to the direct damage to the liver, there is another problem liver flukes can precipitate and that is Redwater.

Redwater (Bacillary Hemoglobinuria) can affect cattle at any time of the year; however, it is most common in the late spring, summer, and autumn. Redwater is caused by a bacterium called *Clostridium hemolyticum*, which colonizes in the liver of susceptible cattle and produces protein toxins that in turn destroy the body's red

To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products which are not mentioned.

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blood cells, damages other organ systems and rapidly causes death. The migrating flukes damage local areas in the liver causing low oxygen tension and the bacteria prefer these conditions and begin to grow rapidly in these damaged areas. The disease has a short incubation period and the vast majority of affected cattle are usually found dead and bloated.

Another problem liver flukes seem to be associated with is decreased fertility. Studies have been published that show decreased pregnancy rates in replacement heifers and increased age to puberty in heifers infected with liver flukes. Thus, flukes can cause losses in a number of ways: (1) direct damage to the liver, with weight loss and diarrhea, (2) death loss due to Redwater secondary to liver damage of migrating flukes, and (3) decreased reproductive performance.

Can we eliminate liver flukes? Because of our relatively mild winter conditions, the abundance of snails (the intermediate host), and wildlife reservoirs, it is doubtful we will be able to eliminate flukes on our ranches. We do not have liver flukes as a problem in our feedlots or dairies because of the absence of these sources of infection.

How can we minimize the losses due to flukes? Our best option is the use of drugs to kill the flukes during strategic times of the year. Unfortunately, the timing is dependent on the individual ranch operation. Killing the adult flukes that are residing in the liver of cattle **before** turning them onto clean pastures seems to be the most cost-effective strategy. This not only kills the flukes; but it prevents further shedding of eggs on the pastures. Maximum transmission of flukes occurs in spring and summer in warmer regions and late summer to fall in cooler regions.

Depending on your pasture rotation schedule, the use of drugs to kill flukes in the fall or late winter/spring should be the minimum management strategy.

Which drugs are effective against liver flukes? Currently, there are only two drugs available that are effective against liver flukes in cattle. Both work best against the adult flukes, but there is some effect on the migrating juvenile flukes. Clorsulon is effective only against liver flukes and it is sold alone as Curatrem® or in combination with ivermectin as Ivomec® Plus.

Thus, Curatrem® can be used to kill the flukes or Ivomec® Plus can be used to kill the flukes plus the internal parasites (worms) and external parasites (sucking lice). Additionally, albendazole (Valbazen®) has activity against flukes and internal parasites. All the drugs and combinations of drugs have advantages and disadvantages in terms of cost, ease of administration, withdrawal times, and effectiveness. Consult with your veterinarian to be certain which product will work best for your operation. Also, review with your veterinarian the time of year that will be most cost-effective for administration of drugs to kill flukes.

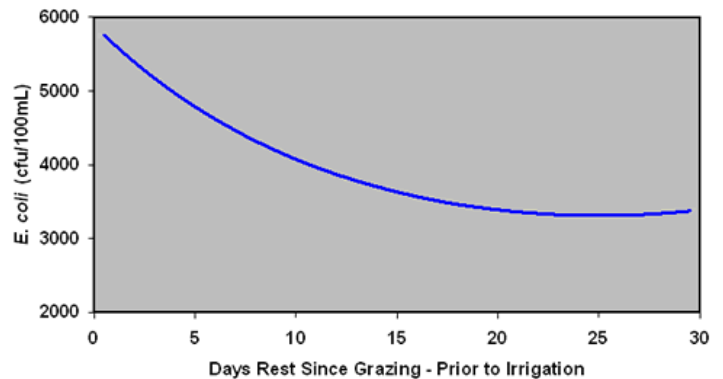
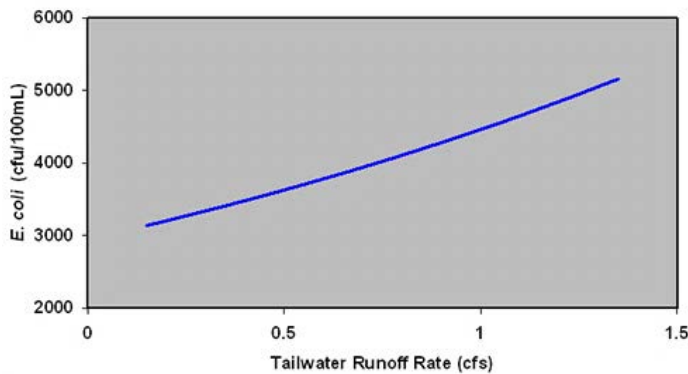
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IRRIGATED PASTURE MANAGEMENT TO REDUCE *E. COLI* IN TAILWATER

As irrigation season nears, here is a reminder on how your management decisions can impact water quality. This project examined the transport of *E. coli* from a 12 acre flood irrigated pasture to determine how pasture management affected concentrations in pasture runoff. Irrigation was managed to create a range of runoff rates during 14 irrigation events. This allowed us to investigate the potential to reduce *E. coli* concentrations by reducing runoff rate; thus, reducing erosion of bacteria from cattle fecal pats and flushing of bacteria from the pasture. The timing of grazing by beef cattle was managed to create a range of total days rest between grazing and irrigation of the pasture. This allowed us to characterize the reduction in *E. coli* attributable to processes such as mortality of *E. coli* and drying of fecal pats.

Irrigation	Irrigation Rate (cfs/ac)	Rest from Grazing Prior to Irrigation (days)	Runoff Rate (cfs/ac)
7/1/04	2.5	9	1.38
7/13/04	0.7	21	0.52
7/27/04	1.7	0	1.02
9/2/04	1.7	0	1.22
9/19/04	0.7	16	0.60
10/2/04	2.5	29	1.67
10/17/04	0.7	0	0.47
6/16/05	2.5	0	1.53
6/29/05	1.7	8	1.19
7/11/05	0.7	20	0.36
7/26/05	0.7	35	0.68
8/8/05	2.5	0	1.47
8/19/05	1.7	9	1.00
8/31/05	0.7	0	0.47

Pasture irrigation and grazing was managed to create a range of runoff and days rest from grazing across 14 irrigation events. We found that as irrigation runoff increased, *E. coli* in pasture runoff increased. This was due to increased pollutant mobilization and transport capacity as runoff rate increases. *E. coli* concentrations were highest when cattle were actively grazing the pasture. *E. coli* concentration was reduced with increased rest between grazing and irrigation. This was due to: 1) natural mortality of microbes in cattle fecal pats as pat age increases; and 2) the drying of the fecal pat and the formation of a dry shell on the outside of the pat reducing the susceptibility of the pat to erosion by irrigation water flowing across the pasture.



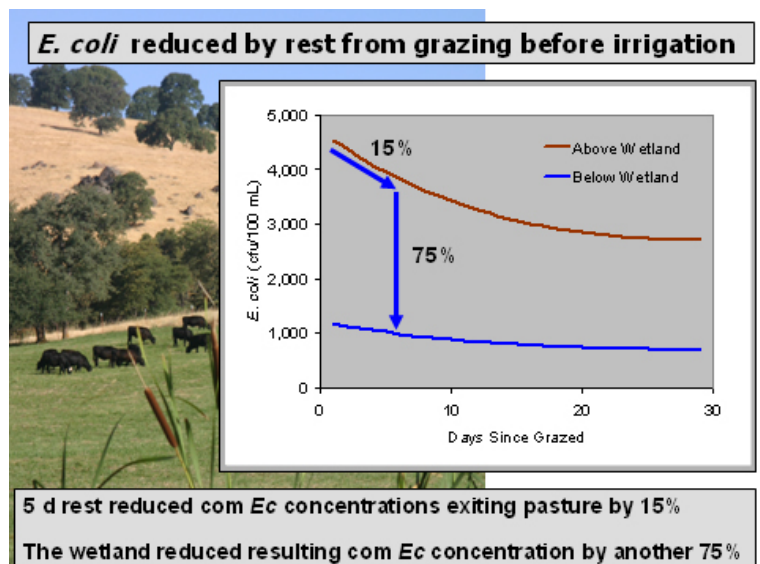
Irrigation and grazing management can reduce *E. coli* transport from pastures.

Management Implications

E. coli transport from pastures can be reduced with irrigation management designed to minimize tailwater runoff rate and volume. Significant reduction in *E. coli* concentration can also be achieved by rotating cattle out of a pasture to allow several days of rest from grazing prior to irrigation.

Supporting Information

Knox, A.K., K.W. Tate, R.A. Dahlgren, and E.R. Atwill. 2007. Management Reduces *E. coli* in Irrigated Pasture Runoff. California Agriculture. 61:159-165.



61st Annual Oakdale Livestock Forum

March 19, 2013
Oakdale Community Center
110 South Second Street
Oakdale, CA 95361

This meeting is sponsored by the University of California Cooperative Extension, the California Beef Cattle Improvement Association and the Calaveras, Tuolumne and San Joaquin/Stanislaus Cattlemen's Associations.

- 9:30 am Registration and Morning Hospitality
- 10:00 Welcome, Opening Remarks
- 10:00 **Successional Ranch Planning 101**
Dr. Bill Stewart, UCCE Forest Management Specialists
- 12:30 pm **Beef Lunch Co-Sponsored by A.L. Gilbert & Yosemite Farm Credit**
Prepared by the San Joaquin/Stanislaus Cattlewomen's Association
- 1:15 pm **Pinkeye: Causes, Treatment and Prevention**
Dr. John Angelos, Associate Professor Vet Med Extension Specialists
- 2:00 **Updates from the Department of Wildlife Services**
Wade Carlson, District Supervisor
- 2:45 **California Rangeland Conservation Coalition**
Pelayo Alvarez, Director
- 3:30 **Closing Remarks and snacks for the road**

*Please be sure to visit with our sponsors and thank them for their continued support:
A.L. Gilbert and Yosemite Farm Credit.*

61ST ANNUAL OAKDALE LIVESTOCK FORUM

REGISTRATION FORM

Tuesday

March 19, 2013

110 South Second Street

Oakdale, CA

Name: _____

Address: _____

Daytime Phone: (____) _____ Number Attending _____

Refreshments and lunch will be provided to all participants.

Please return this form with payment of \$10.00 for each participant. Enclose a check or money order payable to U.C. Regents. Payments & Registration are due by March 8th, 2013 (or pay \$15.00 at the door).

Mail registration to:

Theresa Becchetti, Livestock Advisor

U.C. Cooperative Extension

3800 Cornucopia Way, Suite A

Modesto, CA 95358

(209) 525-6800

A Calaveras, San Joaquin, Stanislaus & Tuolumne Counties educational program



University of California
 Agriculture and Natural Resources
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LIVESTOCK LINES

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UPCOMING EVENTS

- ★ March 19, 2013 - 61st Oakdale Livestock Forum
- ★ April 3, 2013 - 30th Westside Ranchers Meeting

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