[PHOTO BY SHAUNA ROSE HERMEL]

Penny-wise, Dollar-foolish

Beef researchers warn that failing to include deworming in your preweaning strategy could cost you more money in the long run.

Story by
ED HAAG

Johnny Rossi, Extension animal scientist at the Coastal Plain Experiment Station, Tifton, Ga., is one of a growing number of beef specialists advocating a comprehensive preweaning strategy that includes deworming well in advance (60-90 days) of the high-stress event.

He notes that it is not uncommon for producers to view this practice as optional, choosing instead to forgo deworming entirely until the calves and mother cows are brought in for weaning and sorting.

Rossi sees this practice as short-sighted and fraught with economic risk. He points out that the failure to deworm calves well in advance of weaning not only has the potential of affecting how a calf physically responds to the stress and trauma of weaning, but Rossi's research also shows a significant spread in weaning weight between calves dewormed three months before weaning and a control group that didn't receive the treatment.

Deworming shows response

For Rossi there is no shortage of reasons for deworming prior to weaning. These pertain to both the benefits derived in the months prior to weaning as well as the benefits derived during and after weaning.

Table 1: Average daily gain (ADG) of calves at the Northwest Research and Education Center, Calhoun, Ga., 91-day trial

	Non-dewormed		Dewormed		P-value		
Item	Steers	Heifers	Steers	Heifers	Deworm	Sex	Sex × deworm
No. of calves	48	56	48	57	-----	-----	-----
Initial wt., lb.	402.0	373.4	397.3	373.1	0.339	0.001	0.799
Final wt., lb.	593.2	555.2	592.3	557.0	0.589	0.096	0.881
ADG days 0-30	2.19	2.10	2.23	2.14	0.810	0.803	0.808
ADG days 31-58	1.91	1.65	1.97	1.77	0.740	0.053	0.615
ADG days 0-58	2.06	1.89	2.10	1.96	0.879	0.121	0.896
ADG days 59-91	2.18	2.20	2.22	2.13	0.319	0.459	0.945
Overall ADG	2.10	2.00	2.14	2.02	0.590	0.097	0.882

Table 2: ADG of calves at the Central Research and Education Center, Eatonton, Ga., 97-day trial

	Non-dewormed		Dewormed		P-value		
Item	Steers	Heifers	Steers	Heifers	Deworm	Sex	Deworm × sex
No. of calves	31	27	31	28	-----	-----	-----
Initial wt., lb.	401.2	367.1	401.6	356.3	0.6707	0.0001	0.6485
Final wt., lb.	590.0	538.7	600.3	529.2	0.0999	0.0334	0.6757
ADG, days 0-30	2.32	2.06	2.42	2.10	0.3849	0.1219	0.9874
ADG, days 31-62	2.13	1.85	2.25	1.90	0.2675	0.0117	0.7932
ADG, days 0-62	2.23	1.96	2.33	2.00	0.1805	0.0063	0.8573
ADG, days 62-97	1.49	1.45	1.57	1.42	0.3876	0.7191	0.6541
ADG, days 0-97	1.93	1.76	2.03	1.77			

Table 3: Performance of calves at the Southwest Research and Education Center, Plains, Ga., 77-day trial

	Non dewormed		Dewormed		P-value		
Item	Steers	Heifers	Steers	Heifers	Deworm	Sex	Deworm × sex
No. of calves	14	20	15	20	-----	-----	-----
Initial wt., lb.	380.9	367.9	383.1	364.3	0.9578	0.2503	0.8353
Final wt., lb.	539.9	515.7	549.9	520.6	0.1059	0.0427	0.9468
ADG, days 0-72	2.32	2.13	2.34	2.27	0.2745	0.0868	0.4214
ADG, days 0-77	2.06	1.92	2.17	2.03	0.1058	0.0427	0.9464

The effect internal parasites can have on nursing calves can be significant, especially when their systems are already stressed by drought conditions and limited grazing opportunities for their mothers. Rossi notes that nursing calves become infested as soon as they begin to graze and, if not dewormed in a timely fashion, there is even the remote possibility they might not survive into weaning.

"From personal experience, we have lost a calf or two from worm infestations in a particularly bad year," Rossi says, adding that while this represents a financial loss to a cow-calf operator, a similar event involving high-potential calves could prove disastrous to a seedstock producer and his or her breeding program. Considering the cost of treatment, he adds, "It just isn't worth the gamble when you are dealing with high-return animals."

In the southeastern states, where most calves are born in early January to mid-March, Rossi recommends deworming in June or July, when cattle producers typically consolidate their pairs to remove the bulls, apply fly treatment, dehorn and vaccinate.

"Labor isn't a big issue because you are going to get your cattle together and work them anyway," he says. "At most it will take a minute or two extra per calf to deal with the worms, and you will more than pay for the price of the treatment."

Cost effective

Rossi's assessment of the return on investment (ROI) is supported by the findings of a Texas A&M University research team who reported in 2004 that in 11 of 12 trials conducted, calf weights increased 8 to 46 pounds (lb.) when they were dewormed 90 days before weaning. When they used 12.5 lb. as a conservative average gain, the return ($1.10 per lb.) minus the cost of the dewormer ($0.74 per animal) provided a net return on the investment of $13.01.

While the results from the deworming study conducted by Rossi and his colleagues at three University of Georgia (UG) Research and Education centers weren't as dramatic as the ones associated with the Texas A&M trials, they did confirm the practice has economic merit.

The UG deworming study involved 395 cow-calf pairs — 209 at the Northwest Research and Education Center in Calhoun, 117 at the Central Branch Experiment Station in Eatonton and 69 at the Southwest Research and Education Center in Plains.

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Table 4: Avg. fecal egg counts of cows and calves at time of deworming, eggs per gram

Location	% infected cows	Cow fecal egg count, eggs/g	% infected calves	Calf fecal egg count, eggs/g
1	36	12	35	1
2	47	12	65	8

Table 5: Avg. weight change of cows and their calves following deworming in July, Trial 1

Treatment, cow/calf	No. of pairs	Initial cow wt., lb.	Wt. change, lb.	Calf wt. gain, lb.
Trt/Trt	22	1,200	-8	209
Trt/Con	23	1,266	-33	206
Con/Trt	26	1,222	0	207
Con/Con	24	1,203	7	211

[a]Least squares means.

Half of the calves at each center were dewormed at different dates prior to weaning, with those at Calhoun being treated 91 days prior to weaning; at Eatonton, 97 days prior to weaning; and at Plains, 77 days prior to weaning.

The remaining halves from each center were designated control groups and received no deworming treatment. To establish continuity and eliminate the possibility of infested mothers affecting the outcome of their offspring, all cows were dewormed at the beginning of the study.

Calves were weighed at the time of treatment and then approximately 30, 60 and 90 days after treatment.

The effect internal parasites can have on nursing calves can be significant, especially when their systems are already stressed by drought conditions and limited grazing opportunities for their mothers.

—Johnny Rossi

Results vary by site

For Rossi, the results of the Georgia study were conclusive. All nursing calves dewormed prior to weaning increased weaning weights at all locations when compared with control groups. On average, weaning weights were increased by 2.8 lb. at Calhoun, 5.9 lb. at Eatonton, and 8.5 lb. at Plains (see tables 1, 2 and 3, pages 42, 43). Using these final figures and a base cost of $1.50 per treatment, Rossi calculates that expected return on the treatment at today's beef prices ranges from 2-to-1 to 9-to-1.

"For example, we saw a $2.77 return on one group and $5.15 on another group," he says. "It is well worth your investment. At worst you will break even, and most of the time you will be money ahead."

Rossi attributes the variation in effectiveness of the deworming treatments at the different locations to several possible causes. He explains that groups that have greater exposure to the worm larvae are likely to reflect that reality in lower weights for the untreated control calves and greater weight differentiation between treated and untreated animals. Rossi cites some

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Table 6: Avg. initial weight and weight change of cows and their calves following deworming in July[a], Trial 2

Treatment, cow/calf	No of pairs	Initial cow wt., lb.	Wt. change, lb.	Body cond. score	BCS change	Calf wt. change, lb.
Trt/Trt	23	1,115	86	5.0	0.02	245
Trt/Con	23	1,073	100	5.1	0	231
Con/Trt	25	1,115	73	5.0	-0.06	244
Con/Con	24	1,123	81	5.1	-0.20	247

[a]Least squares means.

possible reasons for the discrepancy in exposure rates between sites.

"Stocking rate certainly has an effect on the amount of worms a calf might pick up," he says. "Also how close [to the ground] they are grazing makes a difference. Larvae tend to be found near the ground."

Glenn Selk, Oklahoma State University (OSU) beef Extension professor, saw similar site variations in calf deworming studies conducted by OSU. Like the studies conducted in Georgia, the weight gain recorded in treated calves more than justified the practice.

"We got a sizeable response in our calves — in the neighborhood of 20 to 22 pounds in weaning weight if we dewormed the calf," he says. "Our research shows that treating the calf before weaning was well worth the money."

Deworming strategies evaluated

Selk points out that the deworming studies conducted by OSU researchers not only involved treating calves alone but also compared the effect of treating mother cows and not calves and treating both mother cows and calves.

"We wanted to determine the cost-effectiveness of each of these strategies to see which worked best for our ranchers," he says. "This required several years of data."

From 1992 to 1995, four deworming trials were conducted at one of OSU's Eastern Research Stations located at Haskell, Okla., about 16 miles east of Muskogee. Each study involved approximately 40 crossbred cows and their calves. Pairs were blocked by sex of calf, calf age and cow age, then randomly allotted to three treatments:

1. control,
2. deworm cow and calf, and
3. deworm calf only.

Cows and calves were individually identified and weighed at the beginning of each study. Treated animals received label-recommended dosages of ivermectin pour-on. Pairs grazed in rotation seven Bermuda grass pastures overseeded with clover at a stocking rate of 2 acres per cow during the 148-day trial.

Previous studies indicated that a low worm-infestation rate was present in 1991 and 1992. At that time fecal egg counts ranged from 0 to 28 eggs per 3-gram sample of feces (see Table 4, page 44). A follow-up study in 1996 also included pairs of which only the cows received the deworming treatment. Selk says the results of the five studies proved significant. He points out, as an example, that treated spring-born calves had significantly greater daily weight gains (0.14 lb. per day; $P<0.04$) nursing non-treated cows. This resulted in a 21-lb. weaning weight advantage compared to non-treated controls.

He adds that the gains of treated calves nursing on treated cows proved

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even more impressive, reflected in average daily weight gain (0.17 lb. per day; P<0.003) when compared with untreated calves nursing untreated cows.

"Over a five-month period we saw a weight gain advantage of about 25 lb. in additional weaning weight when compared with the control group," Selk says.

In spite of the difference in weight gain between the group in which both the cow and calf were treated and the group in which only the calf was treated, when all factors were considered the calf alone treatment was found to be most profitable.

"We found that the most effective use of the deworming dollars in our trial was deworming the calf alone," Selk says. "From an overall economic standpoint it was the best strategy."

In contrast, treating cows but not their calves resulted in a very small advantage in average daily calf weight gains (see Table 7). "This was probably from increased milk production," Selk says.

Effective in humid environment

He cautions that the results from the Oklahoma studies reflect the location in which they were conducted. "This was a typical Eastern United States situation where the pastures were intensely managed, there is a lot of moisture, and the stocking rates were quite high," he says. "I am not sure if you would see as high a response in the West's more arid native range-type country where you would have lower cow-calf densities and, therefore, lower worm load."

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>
> —*Glenn Selk*

While the jury still may be out on the effect deworming has on nursing calves pastured on sparsely stocked native range, studies conducted at University of Florida's North Florida Research and Education Center in Marianna show that several breeds of spring-born calves, including Angus, do benefit from the treatment. Dewormed calves gained 8.7 lb. more total body weight during the summer, and their average daily gain (ADG) was 0.1 lb. per day greater than their unwormed counterparts.

The deworming returned $9.57 per head more net revenue (total weight gain in pounds multiplied by $1.28 per lb. minus $1.57 per head deworming cost). Additional labor was not included in the formula.

Benefits beyond weight gain

While Selk sees weight gain as a major reason for deworming calves three months in advance of weaning, he points out that it isn't the only reason for adopting the practice. For seedstock producers the issue of optimizing an animal's genetic potential during a formative period of development comes into play.

"A big part of any seedstock producer's program is growth," Selk says. "That can easily be inhibited by a serious worm infestation."

He adds that a worm infestation doesn't change the genetic capabilities of a calf, but it can influence its ability to express what genetic potential it has for the owner or the potential buyer.

"By deworming his calves at that critical time, a seedstock producer is assured that his bull or heifer will not be pulled down by *Ostertagia*," Selk says. "It is a small price to pay for that kind of insurance."

Table 7: Effect of treating spring-calving cow-calf pairs or calf only with ivermectin on cow and calf weight gain[a]

		Ivermectin	
Item	Control	Cow/calf	Calf only
Number of animals:			
Cows	14	16	14
Calves	14	16	14
Cows:			
Weight, lb., June 3, 1996	1,046	1,139	1,075
Weight gain, lb., to Oct. 29, 1996	118	131 (P<0.50)[b]	136 (P<0.62)[b]
Calves:			
Weight, lb., June 3, 1996	249	261	265
Weight gain, lb., to Oct. 29, 1996	280	302 (P<0.12)[b]	287 (P<0.63)[b]

[a]Least squares means with sex of calf in the model.

[b]Probability that treatment weight gain is similar to controls.