

The Latest Across the Plains

Timely Reminders

- ◆ Keep pens box scraped.
- ◆ Haul manure whenever possible.
- ◆ Have your calving facilities and OB equipment ready.
- ◆ Have the right mineral for your cows' stage of production.
- ◆ Prepare now so your Hi-mag and Fly control minerals are on hand.
- ◆ Target a BCS of 5-5.5 on mature cows and 5.5-6.0 on heifers at calving.
- ◆ Be sure to adjust cow nutrition to match requirements as they calve.
- ◆ Make sure waterers are clean and in good working order.
- ◆ Decide which implant you will use on calves.
- ◆ Semen check bulls.

Unused Feed

"Hard work spotlights the character of people: some turn up their sleeves, some turn up their noses, and some don't turn up at all." – Sam Ewing

Save Money \$\$\$ Test Your Feeds

Tests are relatively inexpensive, usually costing less than \$18, for the information derived. Contact our office to set up an appointment to have us pull feed samples if we have not done so yet.

What's New in the Industry

GPLC now has a mobile-friendly format available for diet batches. Contact our office staff for more information.

We want to hear from you...

Do you have a question you would like one of the nutritionists to address in depth in our newsletter? Just submit your question through our website www.GPLC-Inc.com and we will get to work on it.

Calendar of Events

- **Mar 24 - 26** NCBA Spring Conference, Washington D.C.
- **Mar 29 - 31** Mid America Farm Expo, Salina, KS
- **Mar 29 - 31** Wisconsin Public Service Farm Show, Oshkosh, WI
- **Apr 4 - 7** National Institute for Animal Agriculture, Kansas City, MO
- **Apr 6 - 8** Great Bend Farm and Ranch Expo, Great Bend, KS
- **Apr 8 - 10** Cattle Raisers Convention & Expo, Forth Worth, TX
- **Apr 13 - 15** NAMA's Agri-Marketing Conference & Trade Show, Kansas City, MO
- **Apr 14 - 16** Oklahoma City Farm Show, Oklahoma City, OK
- **Apr 24** Regional Livestock Event, Indianola, IA



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Current Status of Parasite Resistance in US Cattle

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“Parasite resistance” to the macrocyclic lactones which includes ivermectin (Ivomec®/Ivomec®Plus - Merial), doramectin (Dectomax®- Zoetis), eprinomectin (Eprinex®, Eprinex LongRange™-Merial) and moxidectin (Cydectin® - Boehringer Ingelheim) is receiving considerable attention in the US cattle industry at a time when the economics of gastro-intestinal and lung parasitism constitute one of the most important factors involved in promoting efficient beef production. Parasites universally affect cattle in more ways than any other disease syndrome; not only from the parasites themselves, but also from the negative effect they have on the immune system¹. Parasite-free animals grow better, milk better, reproduce better, utilize feedstuff more efficiently, maintain better body-condition scores, over-winter better and have less disease problems such as coccidiosis and “pink eye” than parasitized animals. Knowing whether a dewormer is effectively working is therefore extremely important to an operation. If parasites become resistant to a particular product or product formulation, a serious problem can develop unknowingly unless producers have an easy way to determine product efficacy in their operation.

The fecal egg count reduction test (FECRT) is a simple test that allows producers to effectively determine whether parasite resistance is a problem on their operation. This test simply involves conducting a fecal exam at the time of treatment and again 14 days following treatment. The concept is the 14 days gives all dewormers time enough to work and that at this time-point, egg count should be negative. If counts are not at negative levels two weeks following treatment, a calculation can be conducted to determine efficacy by comparing post-treatment counts to pre-treatment counts. One note on the protocol is that if random samples are taken either at the pre- or post-treatment interval, a minimum of 18-20 samples are necessary to satisfy statistical analysis protocol. The second note of equal importance is that all egg counts should be conducted using the Modified Wisconsin Sugar Flotation Technique since it is the one test that has the necessary level of sensitivity to accurately measure worm egg counts in cattle^{2,3}. Interpretation of the results is simple. Where the calculations indicate that efficacy levels are above 90%, the dewormer is working but if the calculations indicate efficacy levels below 90% then parasite resistance is probably a problem⁴.

A national data base was set up in 1999 at the University of Nevada to monitor efficacy of all products tested. At the current time, over 580 trials have been conducted across 24 states involving 21,827 samples (10,985 taken at the time of treatment and 10,842 taken 14 days following treatment). The following results provide summarized data collected during the past 5 years and then compares these data to data collected prior to 2008:

Table 1: Efficacy Summary for Fecal Egg Count Reduction Test Conducted with Injectable Endecticides.

Products	No. of Trials	No. of Samples	Egg Counts/3g*		Percent Efficacy
			Pre-Rx	Post-Rx	
Injections:					
Ivomec® Inj.	24	1,312	71.8	37.9	47.2%
Ivomec® Plus	16	667	106.5	58.5	45.1%
Dectomax® Inj.	34	1,400	69.9	14.6	79.1%
Cydectin Inj.	9	394	32.1	5.2	83.8%
Ivermectin Inj.	10	506	90.7	55.0	39.4%
Ivermectin Plus	5	193	97.5	48.6	50.1%
Summary:	98	4,472	76.4	32.5	57.4%

* All samples taken at Rx and again 2 weeks post-Rx.

Table 2: Efficacy Summary for Fecal Egg Count Reduction Test Conducted with Pour-on Endecticides.

Products	No. of Trials	No. of Samples	Egg Counts/3g*		Percent Efficacy
			Pre-Rx	Post-Rx	
Pour-ons:					
Ivomec® PO	20	803	55.4	27.2	51.0%
Ivermectin PO	80	3,327	62.9	29.5	53.2%
Dectomax® PO	23	941	67.9	23.7	65.0%
Cydectin® PO	22	918	54.2	14.3	73.7%
Eprinex® PO	5	224	38.1	25.8	32.2%
PO Summary	150	6,213	60.6	26.0	57.0%

* All samples taken at Rx and again 2 weeks post-Rx.

Table 3: Efficacy Summary for Fecal Egg Count Reduction Test Conducted with Various Formulations of Safe-Guard® and Panacur®.

Product	No. of Trials	No. of Samples	Egg Counts/3g*		Percent Efficacy
			Pre-Rx	Post-Rx	
Pour-on Drench					
Panacur® Drench	32	1,296	59.3	0.7	98.8%
Safe-Guard® Drench	71	2,979	65.2	0.8	98.8%
Summary Drench	103	4,275	63.3	0.7	98.8%
Feed					
Safe-Guard® Feed	25	1,297	45.6	0.1	99.7%
Safe-Guard® 1.96%	19	803	38.6	0.7	98.1%
Safe-Guard® Mineral	8	306	36.6	1.5	95.9%
Safe-Guard® Paste, Blocks, Liquid Feed	20	835	38.1	1.6	95.8%
Overall Summary:	175	7,516	53.9	0.7	98.7%

*All samples taken at Rx and again 2 weeks post-Rx.

Table 4: Efficacy Summary for Fecal Egg Count Reduction Test Conducted with Safe-Guard®/Panacur® in Combination with Various Endecticide Formulations.

Combination Product	No. of Trials	No. of Samples	Egg Counts/3g		Percent Efficacy
			Pre-Rx	Post-Rx	
Safe-Guard/Panacur Drench plus					
Ivomec® PO/Inj./Plus	21	805	79.4	0.4	99.4%
Ivermectin PO/Inj.	34	1,424	81.3	1.1	98.6%
Dectomax® PO/Inj.	7	263	97.9	0.1	99.8%
Cydectin® Inj.	1	41	134.2	0.7	99.4%
Combination Summary	63	2,533	78.6	0.7	99.1%

*All samples taken at Rx and again 2 weeks post-Rx.

Table 5: Comparison Efficacy Summary for Fecal Egg Count Reduction Test Conducted with Injectable Endecticides (2008 summary compared with 2015 Summary).

Products	No. of Trials (2008)	Percent Efficacy	No. of Trials (2008-2015)	Percent Efficacy	Percent Change
Injections:					
Ivomec® Inj.	6	76.2%	24	47.2%	-29.0%
Ivomec® Plus	6	42.6%	16	45.1%	----
Dectomax® Inj.	11	89.9%	34	79.1%	-10.8%
Cydectin Inj.	2	98.1%	9	83.8%	-14.3%
Ivermectin Inj.	1	50.0%	10	39.4%	-10.6%
Ivermectin Plus	0	0	5	50.1%	----
Summary:	26	72.5%	98	57.4%	-15.1%

* All samples taken at Rx and again 2 weeks post-Rx.

Table 6: Comparison Efficacy Summary for Fecal Egg Count Reduction Test Conducted with Endecticides Pour-Ons (2008 summary compared with current summary).

Products	No. of Trials (2008)	Percent Efficacy	No. of Trials (2008-2015)	Percent Efficacy	Percent Change
Pour-ons:					
Ivomec® PO	8	72.3%	20	51.0%	-21.3%
Ivermectin PO	35	59.7%	80	53.2%	-06.5%
Dectomax® PO	8	78.9%	23	65.0%	-13.9%
Cydectin® PO	9	67.2%	22	73.7%	----
Eprinex® PO	---	-----	5	32.2%	-----
PO Summary	60	66.1%	150	57.0%	-09.1%

* All samples taken at Rx and again 2 weeks post-Rx.

There are currently only two chemical classes of compounds available for use as a dewormer in the US cattle industry. They are the macrocyclic lactones (listed above) and benzimidazoles (which includes fenbendazole (Safe-Guard®/Panacur® – Merck Animal Health). These data have indicated that, first of all, parasite resistance to all the macrocyclic lactone products is widespread. Secondly, that the current efficacy trends (when compared to those reported in 2008) indicate the efficacy of all macrocyclic lactone products against gastro-



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intestinal parasites is rapidly declining and that “parasite resistance” to the macrocyclic lactones is getting worse each year. Thirdly, data from all the various approved formulations of fenbendazole (Safe-Guard®/ Panacur®) treated cattle remains highly efficacious (98.7%) even though the product has been on the US market for cattle since 1983 (Table 3). The fourth conclusion is that the combination use of a macrocyclic lactone with a benzimidazole prevents resistance from developing with either class of compound.

The fecal test is easy to conduct and provides an easy method to test deworming products under field-use conditions anywhere in the country. The disadvantage of the fecal test is that it doesn't accurately measure the total number of parasites remaining within an animal at the time of treatment, but what it does measure is the number of eggs being shed into the environment following treatment. Since the eggs are being shed by worm parasites that were refractory or resistant to treatment a whole new generation of resistant parasitic nematode worms are being created. These data indicate that the “parasite resistance” problem is not going to get better by itself but rather only worse as each year goes by until the products are totally ineffective.

Since it is not in the best interest for the cattle industry to lose the macrocyclic lactone family of products from their arsenal of products they have to use against both internal and external parasitisms, producers need to be aware that a “parasite resistance” problem is present and work hard to help use these products in a way to keep them efficacious. From the current data, it looks like concurrent use of macrocyclic lactone products with a non-macrocyclic lactone product (such as fenbendazole) is the best way to proceed as shown on Table 4 which demonstrated an average efficacy of 99.1% regardless of which macrocyclic lactone product was used concurrently with fenbendazole. These data indicate that no matter which macrocyclic lactone product is being used; adding fenbendazole to the treatment protocol would help prevent “parasite resistance” from developing. This information would certainly be applicable to backgrounder and feeder calves coming into a confinement situation or brood cows going into a winter situation where internal and external parasite control is required. Where external parasite control is not required then the use of fenbendazole alone (average efficacy of 98.7%) appears sufficient such as any treatment given to the animals during the grazing season (Table 3).

Feedlot/Backgrounder - Parasite Control Protocol: To ensure all animals coming into a feeding period are free of parasites, a combination deworming strategy is necessary (See Table 4).

- 1). Combination deworming upon arrival: Just add a Safe-Guard®/ Panacur® treatment to current protocol without any changes. It can be administered (at the chute) at the same time as the macrocyclic lactone pour-on or injectable product is given or can be administered later in the feed or with mineral supplementation.

Cow/Calf Strategic - Seasonal Deworming Protocol: In beef cattle, the treatment protocol should include the strategy of each year since our goal is to provide seasonal parasite control.

- 1). Fall Deworming Regime (Includes Grub & Lice Control): At the end of the grazing season (preferably after a hard frost), pour cows with pour-on and drench with Safe-Guard® liquid drench or feed cows Safe-Guard® Pellets at the rate of 1.0 lb per 1,000 lb of body weight (Safe-Guard® 0.5%) or 4 oz. per 1,000 lb body weight (Safe-Guard® 1.96%). If feeding area is limited, spread the dose over several days to make sure all animals consume the pellets or mix Safe-Guard® 1.96% flake meal in a weeks-worth of free-choice mineral. Animals should remain free of parasites until grass growth begins the following spring. Deworming in early spring is not necessary if the combination treatment is used in the fall.

- 2). Mid-Spring-Early Summer Strategic Timed Dewormings: Using Safe-Guard 1.96% flake meal, mix correct dose (4 oz. per 1,000 lb of cattle treated) in 4 to 6 days of free-choice mineral mix. Begin treatment 5-6 weeks after turn out or 5-6 weeks after first spring grass growth. Other Safe-Guard® formulations will also work including Safe-Guard® medicated liquid feed or Safe-Guard medicated cubes or cake mix. The bigger calves will consume the medicated mineral formulation so add additional product to include (250 lb or larger) calf weights in calculation.

- 3). Fall Deworming: Repeat fall program listed above.

*Safe-Guard® (fenbendazole) is a product of Merck Animal Health. Ivermectin is a generic available from a number of companies.

References:

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- Dryden MW, Payne PA, Ridley R, Smith V: Comparison of Common Fecal Flotation Techniques for the Recovery of Parasite Eggs and Oocyst. *Veterinary Therapeutics*, Vol 6, No. 1 Spring 2005.
- Bliss DH, Kvasnicka WG: The Fecal Examination: A Missing Link in Food Animal Practice. *Food Animal Parasitology, The Compendium*, April, 1997, pp 104-108.
- Woods IB, Amaral NK, Bairden K, Duncan JK, Kassai T, Malone JB, Pankavich JA, Reinecke RK, Slocombe O, Taylor SM, Vercruyse J: World Association for the Advancement of Veterinary Parasitology (W.A.A.V.P.) second edition of guidelines for evaluation of the efficacy of anthelmintics in ruminants (bovine, ovine, caprine). *Vet Parasitology* 58, 1995, pp 181-213.

External Parasites Also Need To Be Considered

Dr. Ki Fanning, Ph.D., PAS

As you have read in the previous article, pour-ons are losing efficacy for internal parasites; however, they are an effective way to control external parasites. In addition to Safe-Guard, we recommend using a pour-on in the feedlot to control lice and mange. For more detailed feedlot fly control measures, see: <http://gplc-inc.com/pdf/2015/5-7/mayjune2015.pdf> **Fly Control in Feedlots** by Dr. Jeremy Martin.

Cows should also be poured at least twice a year. We recommend two to three methods to control flies on cows. Feeding IGR or **Clarifly** is also an option but keep in mind that they are effective at controlling horn flies that bite the animal but do not travel off the host; however, face flies travel so Clarifly, while labeled for face flies, may not appear to be effective due to the distance face flies travel. This method should be started four weeks prior to fly season and run through its entirety. Fly tags are effective if applied at the appropriate time. An oiler that is maintained and well placed (across gates to waters or salt and mineral) is very effective. Spraying cows with fly spray or spraying them with an ATV sprayer is a very effective spot treatment.

Keeping external parasites to a minimum will improve weight gain and reproduction. It will also reduce pinkeye and its spread. If you have questions about these methods or implementation please give one of the Great Plains Livestock consultants a call.





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