

## Vaccination of Pregnant Heifers with an E. Coli Bacterin Vicogen<sup>®</sup> to Reduce the Incidence and Severity of Calf Scours

D. G. Landblom and J. L. Nelson

It is often said that an ounce of prevention is worth a pound of cure. If this is true, then a program of prevention by vaccination rather than treatment by medication would be desirable. Colostrum from heifers is normally lower in antibody level than colostrum from older cows. Also, heifers tend to produce less milk and are usually poorer mothers than mature cows. Therefore, a pre-calving vaccination program to increase specific immunities in the heifer would seem to be a valid management decision. Recent research at Kansas State University indicates that poor energy input for heifers prior to calving may lower antibody count and in the process, affect the colostrum protection for the calf.

Currently, there appears to be some difference of opinion between U.S. and Canadian workers as to the value of vaccination as a preventive for calf scours.

Work reported by Schipper and Landblom indicated that vaccination of cows with E. Coli bacterins had no demonstrable preventive activity to clinical enteritis in the neonatal calf. Vaccines used in this trial were K99, and the Coligen vaccine.

In other studies by Dr. Schipper, (personal communication) conducted during two calving seasons, 14.6% of Vicogen<sup>®</sup> and 12.3% of Coligen vaccinated heifers had calves that demonstrated clinical enteritis. Only 5.4% of the control calves ( heifers not vaccinated) developed clinical enteritis.

Canadian researchers Makarechian and Acres reported positive results in reducing the incidence of calf scours by vaccinating the heifers with the Vicogen<sup>®</sup> brand of E. Coli vaccine. In their work, vaccination of heifers with

Vicogen<sup>®</sup> at 7 and 3 weeks prior to start of calving reduced the incidence of calf scours considerably. They concluded that every dollar invested in Vicogen<sup>®</sup> vaccination returned \$5.96 at weaning. They also concluded that had the entire herd been vaccinated it would have increased returns by 12.2% at weaning.

The purpose of this investigation is to evaluate the effectiveness of the E. Coli bacterin, Vicogen<sup>®</sup> to develop passive immunity and prevent or lower the evidence and severity of enteritis infections.

By the end of the 1983, 1984 and 1985 calving seasons, a total of 259 first calf heifers have been used to evaluate the use of Vicogen<sup>®</sup>. Heifers used were Hereford and Angus X Hereford crossbreds that were randomly assigned to treatment by age of pregnancy and breed type . In January of each year the heifers were sorted into their assigned groups and vaccinated with Vicogen<sup>®</sup> bacterin or kept as controls. Three weeks later the heifers were given a 3cc booster vaccination of vitamins A and D (500,000 I. U. vitamin A and 75,000 I. U. vitamin D per cc) and a 7-way Clostridium booster vaccination.

Both groups of heifers were housed in uniform but separate calving areas approximately 6 acres in size. These areas are equipped with a slotted board fence for wind protection and an automatic waterer. Both calving areas are adjacent to smaller corrals and a maternity barn. As the heifers calved, they were moved into the smaller corrals until they were mothered up and the calves were nursing well. Those heifers requiring assistance at calving were moved directly into the maternity barn. Following delivery the heifer and her calf were usually moved outside into the corrals within 24-48 hours. Groups of cows and calves 4-7 days old were then transferred to a clean ungrazed forty acre pasture.

All heifers were self-fed mixed alfalfa-crested hay using large round bales fed in 8 foot diameter steel hay feeders. Following calving the heifers were fed five pounds of grain (70% oats and 30% wheat mixed) bulked up with chopped hay daily. In addition they had access to mixed hay and limited grazing. Portable 8 X 8 foot plywood calf shelters provided weather protection for the calves.

All births were recorded showing birth weight, birth date, type of delivery, sire and time of calving. Heifers were checked and assisted when necessary on an every three hour schedule around the clock.

All calves were closely watched to see if they nursed and were accepted by their mothers. All calves were checked daily and those showing signs of diarrhea or scours were caught and treated with Sulkamycin S boluses at the rate of one bolus per fifty pounds body weight. Calves were retreated whenever it was deemed necessary. Cost of the Sulkamycin-S bolus was approximately 32¢ per bolus of 60¢ per treatment assuming the calf weighed about 100 pounds.

A summary for the three calving seasons in this investigation is shown in Table 1, and a brief summary of weather data is shown in Table 2.

Summary: Under calving conditions of this study during the years 1983-1985, problems with calf scours were minimal. No calves were lost due to scours and most calves requiring treatment responded to a single oral administration of Sulkamycin-S medication. The low incidence of scours could well be attributed to the overall management and nutrition of the heifers during this trial. Under similar conditions it would be hard to justify the additional labor and expense required to double vaccinate pregnant heifers with the E. Coli bacterin Vicogen.

<b>Table 1. Three year (1983, 1984, 1985) average scours incidence, treatment and economics of heifers vaccinated with the <u>E. coli</u> bacterin Vicogen and unvaccinated control heifers.</b>		
	Vicogen	Control
No. head	133	126
Percent born by month		
February	.6	0
March	64.2	52.5
April	30.6	44.5
May	4.6	2.2
June	--	0.8

No. of live calves	132.00	121.00
Calving percent	99.2	96.0
Calves treated for scours		
Heifers	10	9
Bulls	15	13
Total	25	22
Percent treated	18.9	18.2
Vaccination cost/heifer, \$	1.80	--
Treatment cost/lot, \$	6.48	16.05
Treatment/calf, \$	.71	4.03
Avg. age in days of calf treated		
Heifers (range in age)	13 (8-26)	11.4 (8-16)
Bulls (range in age)	12.7 (6-27)	13.3 (1-27)

**Table 1a. Summary of scours incidence, treatments, and economics among heifers vaccinated with the E. Coli Bacterin Vicogen<sup>27</sup> and unvaccinated control heifers. 1983, 1984 and 1985 calving seasons.**

	Vaccinated with Vicogen <sup>27</sup>			Control		
	1983	1984	1985	1983	1984	1985
No. Head	59	31	43	55	28	43
Percent born by month						
February	1.7	0	0	0	0	0
March	67.8	61.3	63.4	60.0	46.4	51.2
April	27.1	35.5	29.3	38.2	53.6	41.8
May	3.4	3.2	7.3	1.8	0	4.7
June						2.3
No. live calves	58	31	43	54	26	41
Calving %	98.3	100	100	98.2	92.8	95.3
Calves treated for scours						
Heifers	5	2	3	7	1	1
Bulls	9	3	3	9	1	3
Total	14	5	6	16	2	4
% treated	24.1	16.1	14.0	29.6	10.7	9.3

No. treatments/calf	1.5	1.2	1.0	1.4	1.3	1.0
Range of treatments	(1-3)	(1-2)	(1)	(1-2)	(1-3)	(1)
Vaccination cost/heifer \$	\$1.80	\$1.80	\$180	---	---	---
Treatment cost/lot \$	\$12.60	\$3.24	\$3.60	\$13.80	\$31.94 <sup>2</sup>	\$2.40
Treatment/calf, $\frac{\$}{\text{calf}}$	.90	.64	.60	.86	10.64	.60
Avg. age in days of calf treated						
Heifers (range in age)	10.2 (8-16)	11 (11)	17.7 (9-26)	12.3 (10-16)	8 (8)	14 (14)
Bulls (range in age)	13.6 (6-27)	9.6 (6-14)	15.0 (12-21)	12.3 (8-19)	5 (1-9)	22.7 (17-27)
<sup>2</sup> Veterinarian needed for one very sick calf; successful response.						

Table 2. 1983 and 1984 weather conditions during calving season.				
1983				
	Feb.	March	April	May
Avg. Maximum temperature, °F	37.6	36.4	50.4	62.1
Range, °F	11-58	21-57	31-68	32-86
Avg. Minimum temperature °F	16.6	20.3	24.4	34.4

Range, °F	-4-28	3-30	10-44	21-48
Precipitation				
Snow on ground, inches	1	1.5	1.75	9
Rain & melted snow, inches	.05	.95	.32	1.15
Sky conditions				
Days cloudy	19	21	7	18
Days clear	9	10	23	13
1984				
Avg. Maximum temperature, °F	43.4	36.4	54.5	65.7
Range, °F	24-58	14-65	28-69	47-91
Avg. Minimum temperature °F	16.6	14.6	37.1	35.3
Range, °F	-8-29	-12-31	14-38	17-54
Precipitation				
Snow on ground, inches	1	15.5	28.5	0
Rain & melted snow, inches	.11	1.0	2.9	.05
Sky conditions				
Days cloudy	11	21	16	15
Days clear	18	10	14	16
1985				

Avg. Maximum temperature °F	27.0	43.1	60.1	72.5
Avg. Minimum temperature °F	0.8	15.5	28.9	40.7
Precipitation				
Snow on ground, inches	0	13.5	7.0	0
Rain & melted snow, inches	.06	0.68	0.87	4.31
Sky Conditions				
Cloudy days	11	12	20	17
Clear days	17	19	10	14

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