



Summary of Studies Supporting USDA Product Licensure

Establishment Name	Zoetis Inc.
USDA Vet Biologics Establishment Number	190
Product Code	4570.22
True Name	Bovine Rotavirus-Coronavirus Vaccine, Killed Virus, Clostridium Perfringens Type C-Escherichia Coli Bacterin-Toxoid
Tradename(s) / Distributor or Subsidiary (if different from manufacturer)	Scourguard 4KC - Agrimatco Limited Algeria Scourguard 4KC - No distributor specified Scourguard 4KC - SARL Belophram Scourguard 4KC - Zoetis Industria Produtos Veterinarios Ltda. Scourguard 4KC - Zoetis Industria de Produtos Scourguard 4KC - Zoetis Mexico Scourguard 4KC - Zoetis Russia Scourguard 4KC - Zoetis South Africa Ltd
Date of Compilation Summary	March 01, 2023

Disclaimer: Do not use the following studies to compare one product to another. Slight differences in study design and execution can render the comparisons meaningless.

Study Type	Comparative Serology
Pertaining to	Clostridium perfringens Type C (<i>C. perfringens</i> Type C)
Study Purpose	Comparative serology for <i>C. perfringens</i> to show that combining fractions with satisfactory efficacy studies does not reduce the immune system. Demonstrate passive immunity against diarrhea caused by <i>C. perfringens</i> Type C
Product Administration	2 doses IM, approximately 6 weeks and 3 weeks in pregnant heifers before calving
Study Animals	Pregnant heifers 18 to 30 months old; 52 controls, and 3 groups of 53, 53 and 51 vaccinates
Challenge Description	Serological response
Interval observed after challenge	Blood samples were collected on days 21 and 35 post-vaccination.
Results	<i>C. perfringens</i> Type C Beta Toxoid potency was \geq minimum antigen at release for all vaccinated groups and no interference was shown with the other fractions in the vaccine.
USDA Approval Date	10/25/2004

Study Type	Efficacy
Pertaining to	Bovine Coronavirus (BCV)
Study Purpose	Demonstrate passive immunity against diarrhea caused by BCV in calves
Product Administration	2 doses of vaccine administered intramuscularly (IM) approximately 6 and 3 weeks prior to calving.
Study Animals	Thirty-eight (38) neonatal calves (0 to 6 hours of age) were removed from their dams prior to first nursing and were fed colostrum/milk from pre-assigned heifers that had been vaccinated previously with the vaccine (n = 18) or with a placebo (n = 20).
Challenge Description	BCV administered at 8 to 12 hours of age to calves
Interval observed after challenge	Calves were observed up to 10 days post-challenge for clinical signs and mortality.
Results	<p>Mortality rate and clinical scores for fecal consistency, attitude, appetite, and dehydration for BCV disease were calculated. Fecal scores ≥ 1, attitude score ≥ 1, appetite score ≥ 1 and dehydration score ≥ 1 were considered abnormal.</p> <p><u>Mortality:</u> Calves fed colostrum/milk from pre-assigned heifers that had been vaccinated previously with a placebo: 13/20 (65.0%)</p> <p>Calves fed colostrum/milk from pre-assigned heifers that had been vaccinated previously with the vaccine: 2/18 (11.1%)</p> <p>See the following tables for individual raw data.</p>
USDA Approval Date	08/27/2003

Fecal Consistency Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves Fed Colostrum from Control Dams	02	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 1	0 / 0	2 / 2	2 / 2	1 / 1
	04	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	-	-	-	-
	05	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2	2 / 2	1 / 1	0 / 0
	07	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 1	2 / 2	2 / 2	1 / 1
	09	0 / 0	1 / 1	0 / 0	0 / 0	1 / 1	0 / 0	2 / 2	2 / 2	0 / 0	0 / 0
	11	0 / 0	0 / 0	1 / 1	0 / 0	1 / 1	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2
	13	0 / 0	1 / 1	0 / 0	0 / 0	2 / 2	1 / 1	2 / 2	2 / 2	1 / 1	1 / 1
	16	0 / 0	1 / 1	0 / 0	-	-	-	-	-	-	-
	17	0 / 0	1 / 1	0 / 0	1 / 1	2 / 2	2 / 2	-	-	-	-
	20	0 / 0	0 / 0	-	-	-	-	-	-	-	-
	22	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	2 / 2	2 / 2	-	-
	23	0 / 0	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	-	-	-	-
	25	0 / 0	2 / 2	0 / 0	0 / 0	0 / 0	2 / 2	2 / 2	2 / -	-	-
	28	0 / 0	2 / 2	1 / 1	1 / 1	0 / 0	0 / 0	0 / 0	1 / 1	2 / 2	-
	29	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2	-	-	-	-	-
	32	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / -	-	-	-
	33	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2
	36	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	2 / 2	1 / 1	-	-	-
	38	0 / 0	2 / 2	1 / 1	1 / 1	2 / 2	2 / 2	2 / -	-	-	-
	39	0 / 0	2 / 2	2 / 2	1 / 1	2 / 2	2 / 2	2 / 2	-	-	-
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	2 / 2	1 / 1	1 / 1	0 / 0
	03	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	1 / 1	1 / 1	0 / 0
	06	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0
	08	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	10	0 / 0	2 / 2	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2
	12	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	2 / 2	2 / 2	2 / 2	-	-
	14	0 / 0	2 / 2	0 / 0	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2
	15	0 / 0	2 / 2	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	1 / 1	-	-
	18	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	1 / 1	1 / 1
	19	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	1 / 1	2 / 2	1 / 1	1 / 1	1 / 1
	21	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	1 / 1	0 / 0	0 / 0
	24	0 / 0	2 / 2	0 / 0	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2	1 / 1	1 / 1
	26	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	2 / 2	2 / 2	2 / 2
	27	0 / 0	2 / 2	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2	2 / 2
	31	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2	1 / 1
	35	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	37	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2	1 / 1	1 / 1	2 / 2
	40	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 1

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Fecal Scores: 0 = Normal; 1, 2 = Abnormal

Appetite Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/P M#	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves Fed Colostrum from Control Dams	02	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	04	0 / 1	2 / 2	1 / 2	1 / 2	1 / 2	1 / 1	-	-	-	-
	05	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	07	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	09	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	11	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 0	0 / 0	0 / 0	1 / 2
	13	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	16	0 / 0	1 / 0	0 / 0	-	-	-	-	-	-	-
	17	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	-	-	-	-
	20	0 / 2	2 / 2	-	-	-	-	-	-	-	-
	22	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	-	-
	23	0 / 2	1 / 1	0 / 0	0 / 0	0 / 0	0 / 2	-	-	-	-
	25	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / -	-	-
	28	0 / 0	0 / 1	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	2 / 2	-
	29	0 / 0	0 / 0	0 / 0	0 / 0	0 / 2	-	-	-	-	-
	32	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / -	-	-	-
	33	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2
	36	0 / 0	1 / 0	1 / 1	1 / 1	0 / 0	0 / 0	0 / 2	-	-	-
	38	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	2 / -	-	-	-
	39	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	2 / 2	-	-	-
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	03	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	06	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	08	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	10	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	12	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	-	-
	14	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 2
	15	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	-	-
	18	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	19	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	21	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	24	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	26	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	27	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	31	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	35	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	37	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0	0 / 0	0 / 0	0 / 0
	40	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Appetite Scores: 0 = Normal; 1, 2 = Abnormal

Attitude Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves Fed Colostrum from Control Dams	02	0 / 0	0 / **	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	1 / 2	1 / 1	0 / 1
	04	0 / 1	2 / 0	2 / 2	2 / 2	1 / 2	2 / 2	3 / -	-	-	-
	05	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 1	1 / 2	1 / 2	1 / 1	0 / 1
	07	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	0 / 1	1 / 2	1 / 2	0 / 1
	09	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	1 / 2	0 / 0	0 / 0
	11	0 / 0	0 / 1	0 / 1	0 / 0	0 / 1	1 / 2	2 / 2	1 / 2	2 / 2	2 / 2
	13	0 / 0	0 / 0	0 / 1	0 / 1	1 / 2	0 / 1	1 / 1	1 / 2	1 / 1	2 / 2
	16	0 / 0	1 / 1	0 / 1	-	-	-	-	-	-	-
	17	0 / 0	1 / 1	0 / 1	2 / 2	2 / 2	2 / 3	-	-	-	-
	20	0 / 1	2 / 3	-	-	-	-	-	-	-	-
	22	0 / 0	0 / 1	0 / 0	0 / 0	0 / 1	0 / 1	0 / 1	1 / 2	-	-
	23	0 / 0	1 / 2	0 / 1	1 / 1	1 / 2	2 / 2	-	-	-	-
	25	0 / 0	0 / 1	0 / 1	0 / 0	0 / 1	1 / 2	1 / 2	3 / -	-	-
	28	0 / 1	1 / 2	1 / 2	1 / 2	0 / 1	0 / 0	1 / 1	1 / 1	2 / 3	-
	29	0 / 0	0 / 0	1 / 1	1 / 2	2 / 2	-	-	-	-	-
	32	0 / 0	0 / 1	0 / 0	0 / 1	0 / 0	0 / 0	2 / -	-	-	-
	33	0 / 0	1 / 2	0 / 0	0 / 0	0 / 0	0 / 1	1 / 1	2 / 2	2 / 2	2 / 3
	36	0 / 0	1 / 1	1 / 2	0 / 1	0 / 1	1 / 1	2 / 3	-	-	-
	38	0 / 0	1 / 2	1 / 1	0 / 1	1 / 1	1 / 2	3 / -	-	-	-
	39	0 / 0	0 / 1	2 / 2	1 / 1	1 / 1	2 / 2	2 / 3	-	-	-
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0
	03	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	1 / 1	0 / 0
	06	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	08	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	
	10	0 / 0	1 / 2	0 / 1	0 / 1	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	1 / 1
	12	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 1	1 / 2	2 / 3	-	-
	14	0 / 0	1 / 2	0 / 1	0 / 0	0 / 0	1 / 1	1 / 2	0 / 1	2 / 2	2 / 2
	15	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	-	-
	18	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2	0 / 0	0 / 0
	19	0 / 0	0 / 1	0 / 0	0 / 0	0 / 1	1 / 1	1 / 2	0 / 0	1 / 1	1 / 1
	21	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0	1 / 2	0 / 1
	24	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	1 / 1	2 / 2	2 / 2	1 / 1	1 / 1
	26	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	1 / 1	1 / 2
	27	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2	1 / 1	1 / 1
	31	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 2	1 / 1	0 / 0
	35	0 / 0	0 / 1	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	37	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	1 / 2	2 / 2	1 / 1	1 / 1	2 / 2
	40	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

** = Datapoint not available

- = Animal no longer on study

Attitude Scores: 0 = Normal; 1, 2, 3 = Abnormal

Dehydration Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves Fed Colostrum from Control Dams	02	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	1 / 2	1 / 1	0 / 1
	04	0 / 0	2 / 2	1 / 2	2 / 2	1 / 2	2 / 2	-	-	-	-
	05	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 1	1 / 2	1 / 2	1 / 1	0 / 1
	07	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2	1 / 2	0 / 1
	09	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	1 / 2	0 / 0	0 / 0
	11	0 / 0	0 / 0	0 / 1	0 / 0	0 / 1	1 / 2	2 / 2	1 / 2	2 / 2	2 / 2
	13	0 / 0	0 / 0	0 / 1	0 / 1	1 / 2	0 / 1	1 / 1	1 / 2	1 / 1	2 / 2
	16	0 / 0	1 / 1	0 / 1	-	-	-	-	-	-	-
	17	0 / 0	1 / 1	0 / 1	2 / 2	2 / 2	2 / 3	-	-	-	-
	20	0 / 0	2 / 3	-	-	-	-	-	-	-	-
	22	0 / 0	0 / 1	0 / 0	0 / 0	0 / 1	0 / 1	0 / 1	1 / 2	-	-
	23	0 / 0	1 / 2	0 / 1	1 / 1	1 / 2	2 / 2	-	-	-	-
	25	0 / 0	0 / 1	0 / 1	0 / 0	0 / 1	1 / 2	1 / 2	3 / -	-	-
	28	0 / 0	1 / 2	1 / 2	1 / 2	0 / 1	0 / 0	1 / 1	1 / 1	2 / 3	-
	29	0 / 0	0 / 0	1 / 1	1 / 2	2 / 2	-	-	-	-	-
	32	0 / 0	0 / 1	0 / 0	0 / 1	0 / 0	0 / 0	2 / -	-	-	-
	33	0 / 0	1 / 2	0 / 0	0 / 0	0 / 0	0 / 1	1 / 1	2 / 2	2 / 2	2 / 3
	36	0 / 0	1 / 1	1 / 2	0 / 1	0 / 1	1 / 2	2 / 3	-	-	-
	38	0 / 0	1 / 2	1 / 1	0 / 1	1 / 1	1 / 2	3 / -	-	-	-
	39	0 / 0	0 / 1	2 / 2	1 / 1	1 / 1	2 / 2	2 / 3	-	-	-
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0
	03	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	1 / 1	0 / 0
	06	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	08	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	10	0 / 0	1 / 1	0 / 1	0 / 1	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	1 / 1
	12	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 1	1 / 2	2 / 3	-	-
	14	0 / 0	1 / 1	0 / 1	0 / 0	0 / 0	1 / 1	1 / 2	0 / 1	2 / 2	2 / 2
	15	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	-	-
	18	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2	0 / 0	0 / 0
	19	0 / 0	0 / 1	0 / 0	0 / 0	0 / 1	1 / 1	1 / 2	0 / 0	1 / 1	1 / 1
	21	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0	1 / 1	0 / 1
	24	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	1 / 1	2 / 2	2 / 2	1 / 1	1 / 1
	26	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	1 / 1	1 / 2
	27	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2	1 / 1	1 / 1
	31	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 2	1 / 1	1 / 1
	35	0 / 0	0 / 1	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	37	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	1 / 2	2 / 2	1 / 1	1 / 1	2 / 2
	40	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Dehydration Scores: 0 = Normal; 1, 2, 3 = Abnormal

Mortality (Yes / No)

Treatment Group	Animal ID	Mortality (Yes/No)	
		Yes	No
Calves Fed Colostrum from Control Dams	02		X
	04	X	
	05		X
	07		X
	09		X
	11		X
	13		X
	16	X	
	17	X	
	20	X	
	22	X	
	23	X	
	25	X	
	28	X	
	29	X	
	32	X	
	33		X
	36	X	
	38	X	
	39	X	
Calves Fed Colostrum from Vaccinated Dams	01		X
	03		X
	06		X
	08		X
	10		X
	12	X	
	14		X
	15	X	
	18		X
	19		X
	21		X
	24		X
	26		X
	27		X
	31		X
	35		X
	37		X
	40		X

Study Type	Efficacy
Pertaining to	<i>Escherichia coli</i> K99 (<i>E. coli</i> K99)
Study Purpose	Demonstrate passive immunity against diarrhea caused by <i>E. coli</i> K99 in neonatal calves
Product Administration	2 doses of vaccine administered intramuscularly (IM) approximately 6 and 3 weeks to heifers prior to calving.
Study Animals	Twenty-eight (28) neonatal calves were removed from their dams prior to first nursing: 20 calves were fed colostrum/milk from pre-assigned heifers (one calf to one heifer) that had been vaccinated previously with the vaccine; 8 calves were fed colostrum/milk from pre-assigned heifers (one calf to one heifer) that had been vaccinated previously with a placebo (controls). Calves were negative for pre-colostral <i>E coli</i> antibody titer (≤ 128).
Challenge Description	<i>E coli</i> administered orally at 8 to 12 hours of age to calves
Interval observed after challenge	Calves were observed up to 6 days post-challenge for mortality
Results	<p>Mortality rate was calculated for each treatment group.</p> <p><u>Mortality:</u> Calves fed colostrum/milk from pre-assigned heifers that had been vaccinated previously with a placebo (controls): 8/8 (100.0%)</p> <p>Calves fed colostrum/milk from pre-assigned heifers that had been vaccinated previously with the vaccine: 1/20 (5.0 %)</p> <p>See tables for individual data.</p>
USDA Approval Date	03/28/2005

Mortality Results:

Treatment Group	Animal ID	Mortality Yes / No	
		YES	NO
Calves Fed Colostrum from Control Dams	03	X	
	07	X	
	13	X	
	17	X	
	24	X	
	26	X	
	30	X	
	37	X	
Calves Fed Colostrum from Vaccinated Dams	01		X
	02		X
	06		X
	09		X
	10		X
	12		X
	14		X
	15		X
	18		X
	19		X
	20		X
	21		X
	22	X	
	25		X
	28		X
	31		X
	32		X
	34		X
	36		X
	38		X

Study Type	Efficacy
Pertaining to	Bovine Rotavirus serotype G10 (BRV G10)
Study Purpose	Demonstrate passive immunity against diarrhea caused by BRV G10 in calves
Product Administration	2 doses of vaccine administered intra muscularly (IM) approximately 6 and 3 weeks to pregnant heifers prior to calving.
Study Animals	Thirty-eight (38) neonatal calves were removed from their dams prior to first nursing; 20 calves were fed colostrum/milk from pre-assigned heifers (one calf to one heifer) that had been vaccinated previously with the vaccine; 18 calves were fed colostrum/milk from pre-assigned heifers (one calf to one heifer) that had been vaccinated previously with a placebo. Calves were negative for Pre-colostral virus neutralizing (VN) BRV antibody titer.
Challenge Description	BRV-2292B strain administered orally at 6 to 12 hours of age to calves
Interval observed after challenge	Calves were observed up to 9 days post-challenge for clinical signs and mortality.
Results	Calves were observed for fecal consistency, appetite, attitude, dehydration, and mortality. See tables for individual data
USDA Approval Date	07/29/2004

Fecal Consistency Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves fed colostrum from Control Dams	02	0 / 0	1 / 1	1 / 1	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	1 / 1
	04	0 / 0	0 / 0	1 / 1	1 / 1	1 / 1	1 / 1	-	-	-	-
	08	0 / 0	1 / 1	0 / 0	1 / 1	0 / 0	0 / 0	1 / 1	1 / 1	0 / -	-
	09	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	0 / 1	1 / 1
	12	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
	13	0 / 0	0 / 0	2 / 2	1 / 1	0 / 0	1 / 1	0 / 0	2 / 2	1 / 1	1 / 1
	15	0 / 0	0 / 0	0 / 0	1 / 1	1 / 1	2 / 2	2 / 2	1 / 1	0 / 0	0 / 0
	18	0 / 0	0 / 0	2 / 2	0 / 0	0 / 0	1 / 1	1 / 1	0 / 0	1 / 1	0 / 0
	19	0 / 0	0 / 0	1 / 1	2 / 2	1 / 1	1 / 1	1 / 1	-	-	-
	22	0 / 0	0 / 0	1 / 1	1 / 1	0 / 0	1 / 1	1 / 1	1 / 1	1 / 1	2 / 2
	25	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2	2 / 2	-	-	-	-
	27	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	30	0 / 0	2 / 2	1 / 1	1 / 1	0 / 0	2 / 2	1 / 1	0 / 0	2 / 2	2 / 2
	32	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	2 / 2
	33	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 1	1 / 1	1 / 1	0 / 0
	35	0 / 0	2 / 2	2 / 2	2 / 2	2 / 2	1 / 1	2 / 2	-	-	-
	37	0 / 0	0 / 0	1 / 1	1 / 1	1 / 1	2 / 2	2 / 2	1 / 1	1 / 1	1 / 1
	39	0 / 0	0 / 0	2 / 2	2 / 2	1 / 1	0 / 0	0 / 0	2 / 2	2 / 2	1 / 1
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0
	03	0 / 0	0 / 0	1 / 1	2 / 2	2 / 2	2 / 2	0 / 0	2 / 2	1 / 1	0 / 0
	05	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2
	07	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	10	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	11	0 / 0	0 / 0	2 / 2	1 / 1	1 / 1	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0
	14	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	16	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	17	0 / 0	2 / 2	0 / 0	1 / 1	1 / 1	2 / 2	1 / 1	1 / 1	0 / 0	0 / 0
	20	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	21	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	24	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1
	26	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	28	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 1	1 / 1
	29	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	1 / 1	1 / 1	1 / 1	2 / 2
	31	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	34	0 / 0	2 / 2	0 / 0	1 / 1	0 / 0	1 / 1	1 / 1	2 / 2	0 / 0	1 / 1
	36	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	38	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	40	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 1	0 / 0	0 / 1	0 / 0

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Fecal Scores: 0, 1 = Normal; 2 = Abnormal

Appetite Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves fed colostrum from Control Dams	02	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0
	04	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	-	-	-	-
	08	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	1 / 2	0 / 2	2 / -	-
	09	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0
	12	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	13	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	15	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	18	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	19	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	-	-	-
	22	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 2	0 / 0
	25	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	2 / 2	-	-	-	-
	27	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	30	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	32	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	33	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	35	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 2	-	-	-
	37	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	39	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	03	0 / 0	0 / 0	0 / 0	0 / 1	0 / 2	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	05	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	07	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	10	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	11	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	14	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	16	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	17	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	20	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	21	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	24	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	26	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	28	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	29	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	31	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	34	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	36	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	38	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	40	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Appetite Scores: 0 = Normal; 1, 2 = Abnormal

Attitude Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves fed colostrum from Control Dams	02	0 / 1	1 / 2	1 / 2	2 / 2	1 / 2	1 / 2	2 / 2	2 / 2	2 / 2	2 / 2
	04	0 / 0	0 / 0	1 / 1	0 / 1	0 / 1	1 / 1	-	-	-	-
	08	0 / 1	1 / 2	1 / 2	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	2 / -	-
	09	0 / 0	0 / 0	0 / 1	0 / 0	1 / 2	1 / 1	2 / 2	2 / 2	2 / 2	1 / 2
	12	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 1	2 / 2	1 / 1	1 / 1	1 / 1
	13	0 / 0	0 / 0	1 / 2	0 / 1	0 / 0	0 / 0	0 / 0	1 / 2	1 / 1	0 / 1
	15	0 / 0	0 / 0	0 / 0	1 / 1	0 / 1	1 / 2	1 / 2	1 / 1	0 / 0	0 / 0
	18	0 / 0	0 / 1	1 / 2	1 / 1	1 / 1	0 / 1	1 / 1	0 / 0	0 / 1	0 / 1
	19	0 / 0	0 / 0	1 / 1	1 / 2	1 / 1	2 / 2	2 / 2	-	-	-
	22	0 / 0	0 / 0	0 / 1	0 / 1	0 / 0	0 / 1	1 / 1	0 / 0	0 / 1	2 / 2
	25	0 / 0	0 / 1	1 / 2	1 / 1	1 / 2	2 / 2	-	-	-	-
	27	0 / 0	0 / 0	2 / 2	1 / 2	0 / 1	1 / 1	1 / 1	0 / 0	0 / 0	0 / 0
	30	0 / 0	1 / 2	0 / 0	1 / 2	0 / 0	2 / 2	0 / 1	0 / 0	0 / 1	1 / 2
	32	0 / 0	0 / 0	1 / 1	0 / 1	1 / 1	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2
	33	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0	0 / 1	0 / 0	0 / 1	0 / 0	0 / 0
	35	0 / 0	1 / 1	1 / 2	2 / 2	2 / 2	1 / 2	2 / 2	-	-	-
	37	0 / 0	0 / 1	1 / 1	1 / 1	0 / 0	0 / 1	1 / 2	1 / 2	1 / 0	0 / 0
	39	0 / 0	0 / 1	1 / 2	1 / 1	0 / 0	0 / 0	1 / 1	1 / 2	2 / 1	1 / 1
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	03	0 / 1	0 / 0	0 / 0	0 / 1	0 / 1	2 / 2	0 / 0	1 / 2	1 / 1	1 / 1
	05	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1
	07	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	10	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	11	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	1 / 1	1 / 1	0 / 0	0 / 0	0 / 0
	14	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	16	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	17	0 / 0	0 / 1	0 / 0	0 / 1	0 / 0	0 / 1	1 / 1	0 / 1	0 / 0	0 / 0
	20	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	21	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	24	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1
	26	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	28	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	0 / 1	1 / 1	0 / 1
	29	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2
	31	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	34	0 / 0	1 / 2	0 / 0	0 / 1	0 / 0	0 / 0	0 / 1	1 / 2	0 / 1	1 / 0
	36	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	38	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	40	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0 / 1	0 / 0	0 / 0	0 / 0

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Attitude Scores: 0 = Normal; 1, 2, 3 = Abnormal

Dehydration Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves fed colostrum from Control Dams	02	0 / 0	1 / 2	1 / 2	2 / 2	1 / 2	1 / 2	2 / 2	2 / 2	2 / 2	2 / 2
	04	0 / 0	0 / 0	1 / 1	0 / 1	0 / 1	1 / 1	-	-	-	-
	08	0 / 1	1 / 2	1 / 2	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	3 / -	-
	09	0 / 0	0 / 0	0 / 1	0 / 0	1 / 2	1 / 1	2 / 2	2 / 2	2 / 2	1 / 2
	12	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	1 / 1	2 / 2	1 / 1	1 / 1	1 / 1
	13	0 / 0	0 / 0	1 / 2	0 / 1	0 / 0	0 / 0	0 / 0	1 / 2	1 / 1	0 / 1
	15	0 / 0	0 / 0	0 / 0	1 / 1	0 / 1	1 / 2	1 / 2	1 / 1	0 / 0	0 / 0
	18	0 / 0	0 / 1	1 / 2	1 / 1	1 / 1	0 / 1	1 / 1	0 / 0	0 / 1	0 / 1
	19	0 / 0	0 / 0	1 / 1	1 / 2	1 / 1	2 / 2	2 / 3	-	-	-
	22	0 / 0	0 / 0	0 / 1	0 / 1	0 / 0	0 / 1	1 / 1	0 / 0	0 / 1	2 / 2
	25	0 / 0	0 / 1	1 / 2	1 / 1	1 / 2	2 / 3	-	-	-	-
	27	0 / 0	0 / 0	2 / 2	1 / 2	0 / 1	1 / 1	1 / 1	0 / 0	0 / 0	0 / 0
	30	0 / 0	1 / 2	0 / 0	1 / 2	0 / 0	2 / 2	0 / 1	0 / 0	0 / 1	1 / 2
	32	0 / 0	0 / 0	1 / 1	0 / 1	1 / 1	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2
	33	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0	0 / 1	0 / 0	0 / 1	0 / 0	0 / 0
	35	0 / 0	1 / 1	1 / 2	2 / 2	2 / 2	1 / 2	2 / 3	-	-	-
	37	0 / 0	0 / 1	1 / 1	1 / 1	0 / 0	0 / 1	1 / 2	1 / 2	1 / 0	0 / 0
	39	0 / 0	0 / 1	1 / 2	1 / 1	0 / 0	0 / 0	1 / 1	1 / 2	2 / 1	1 / 1
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	03	0 / 0	0 / 0	0 / 0	0 / 1	0 / 1	2 / 3	0 / 0	1 / 2	1 / 1	1 / 1
	05	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1
	07	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	10	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	11	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	1 / 1	1 / 1	0 / 0	0 / 0	0 / 0
	14	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	16	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	17	0 / 0	0 / 1	0 / 0	0 / 1	0 / 1	0 / 1	1 / 1	0 / 1	0 / 0	0 / 0
	20	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	21	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	24	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1
	26	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	28	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	0 / 1	1 / 1	0 / 1
	29	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2
	31	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	34	0 / 0	1 / 2	0 / 0	0 / 1	0 / 0	0 / 0	0 / 1	1 / 2	0 / 1	1 / 1
	36	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	38	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	40	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0 / 1	0 / 0	0 / 0	0 / 0

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Fecal Scores: 0 = Normal; 1, 2, 3 = Abnormal

Mortality (Yes / No)

Treatment Group	Animal ID	Mortality (Yes/No)	
		Yes	No
Calves fed colostrum from Control Dams	02		X
	04	X	
	08	X	
	09		X
	12		X
	13		X
	15		X
	18		X
	19	X	
	22		X
	25	X	
	27		X
	30		X
	32		X
	33		X
	35	X	
	37		X
	39		X
Calves Fed Colostrum from Vaccinated Dams	01		X
	03		X
	05		X
	07		X
	10		X
	11		X
	14		X
	16		X
	17		X
	20		X
	21		X
	24		X
	26		X
	28		X
	29		X
	31		X
	34		X
	36		X
	38		X
	40		X

Study Type	Efficacy
Pertaining to	Bovine Rotavirus serotype G6 (BRV G6)
Study Purpose	Demonstrate passive immunity against diarrhea caused by BRV G6 in calves
Product Administration	2 doses of vaccine administered intra muscularly (IM) approximately 6 and 3 weeks to pregnant heifers prior to calving.
Study Animals	Thirty-nine (39) neonatal calves were removed from their dams prior to first nursing; 19 calves were fed colostrum/milk from pre-assigned heifers (one calf to one heifer) that had been vaccinated previously with the vaccine; 20 calves were fed colostrum/milk from pre-assigned heifers (one calf to one heifer) that had been vaccinated previously with a placebo. Calves were negative for pre-colostral virus neutralizing (VN) BRV antibody titer.
Challenge Description	BRV, virulent Lincoln strain, administered orally at 8 to 12 hours of age
Interval observed after challenge	Calves were observed up to 9 days post-challenge for clinical signs.
Results	Calves were observed for fecal consistency, appetite, attitude, and dehydration., See the following tables for individual raw data.
USDA Approval Date	10/25/2004

Fecal Consistency Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves Fed Colostrum from Control Dams	02	0 / 0	0 / 0	2 / 2	2 / 2	2 / 3	2 / 2	3 / 3	2 / 2	3 / 3	2 / -
	03	0 / 0	1 / 1	3 / 3	2 / 2	3 / 3	-	-	-	-	-
	05	0 / 0	0 / 0	3 / 3	1 / 1	1 / 1	2 / 2	2 / 2	2 / 2	3 / 3	3 / 3
	07	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	3 / 3	2 / 2	2 / 2
	10	0 / 0	0 / 0	3 / 3	1 / 1	3 / 3	3 / 3	3 / 3	2 / 2	3 / 3	-
	12	1 / 1	2 / 2	3 / 3	3 / 3	3 / 3	2 / 2	-	-	-	-
	14	0 / 0	2 / 2	2 / 2	1 / 1	2 / 2	2 / 2	3 / 3	3 / 3	-	-
	15	0 / 0	2 / 2	2 / 2	3 / 3	-	-	-	-	-	-
	17	0 / 0	0 / 0	3 / 3	3 / 3	2 / 2	2 / 2	1 / 1	3 / 3	2 / 2	2 / 2
	20	0 / 0	2 / 3	1 / 1	2 / 2	1 / 1	1 / 1	0 / 0	0 / 0	3 / 3	3 / 3
	22	0 / 0	3 / 3	3 / 3	3 / 3	3 / 3	2 / 2	0 / 0	2 / 2	0 / 0	0 / 0
	23	0 / 0	2 / 2	2 / 2	1 / 1	0 / 0	0 / 0	3 / 3	2 / 2	1 / 1	1 / 1
	26	0 / 0	3 / 3	3 / 3	2 / 2	0 / 0	3 / 3	0 / 0	0 / 0	2 / 2	1 / 1
	28	0 / 0	3 / 3	3 / 3	-	-	-	-	-	-	-
	30	0 / 0	3 / 3	2 / 2	1 / 1	2 / 2	0 / 0	0 / 0	2 / 2	2 / 2	2 / 2
	32	0 / 0	2 / 2	2 / 2	3 / 3	2 / 2	0 / 0	0 / 0	0 / 0	2 / 2	2 / 2
	34	0 / 0	0 / 0	3 / 3	2 / 2	2 / 2	1 / 1	2 / 2	2 / 2	2 / 2	2 / 2
	35	0 / 0	0 / 0	3 / 3	2 / 2	3 / 3	3 / 3	3 / 3	3 / 3	3 / 3	-
	38	0 / 0	3 / 3	2 / 2	1 / 1	1 / 1	3 / 3	3 / 3	3 / 3	2 / 2	2 / 2
	39	0 / 0	2 / 2	3 / 3	3 / 3	3 / 3	2 / 2	3 / 3	3 / 3	-	-
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	1 / 1	0 / 0	3 / 3
	04	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 1	3 / 3	3 / 3
	06	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	1 / 1	1 / 1
	09	0 / 0	2 / 2	1 / 1	0 / 0	3 / 3	3 / 3	3 / 3	3 / 3	2 / -	-
	11	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	3 / 3	1 / 1	1 / 1	1 / 1
	13	0 / 0	1 / 1	0 / 0	1 / 1	2 / 2	3 / 3	2 / 2	2 / 2	3 / 3	2 / 2
	16	0 / 0	2 / 2	0 / 0	2 / 2	3 / 3	3 / 3	2 / -	-	-	-
	18	0 / 0	0 / 0	1 / 1	0 / 0	1 / 1	1 / 1	3 / 3	3 / 3	3 / 3	3 / 3
	19	0 / 0	0 / 0	2 / 2	2 / 2	0 / 0	1 / 1	0 / 0	3 / 3	3 / 3	3 / 3
	21	0 / 0	1 / 1	0 / 0	2 / 2	1 / 1	2 / 2	2 / 2	3 / 3	1 / 1	0 / 0
	24	0 / 0	2 / 2	2 / 2	1 / 1	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0
	25	0 / 0	2 / 2	0 / 0	0 / 0	2 / 2	0 / 0	1 / 1	1 / 1	2 / 2	3 / 3
	27	0 / 0	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	2 / 2	1 / 1	3 / 3	1 / 1
	29	0 / 0	0 / 0	0 / 0	1 / 1	0 / 0	1 / 1	2 / 2	2 / 2	2 / 2	0 / 0
	31	0 / 0	0 / 0	1 / 1	0 / 0	3 / 3	2 / 2	3 / 3	3 / 3	1 / 1	1 / 1
	33	0 / 0	0 / 0	3 / 3	1 / 1	0 / 0	3 / 3	3 / -	-	-	-
	36	0 / 0	0 / 0	1 / 1	1 / 1	2 / 2	3 / 3	2 / 2	2 / 2	2 / 2	1 / 1
	37	0 / 0	0 / 0	1 / 1	0 / 0	3 / 3	3 / 3	3 / 3	2 / 2	-	-
	40	0 / 0	2 / 2	2 / 2	2 / 2	1 / 1	0 / 0	1 / 1	2 / 2	2 / 2	1 / 1

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Fecal Scores: 0, 1 = Normal; 2, 3 = Abnormal

Appetite Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM # ₀	8 AM/PM #	9 AM/PM #
Calves Fed Colostrum from Control Dams	02	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	2 / -
	03	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	-	-	-	-	-
	05	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	07	0 / 0	0 / 1	1 / 2	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	10	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 2	-
	12	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	-	-	-	-
	14	0 / 0	1 / 2	0 / 0	0 / 1	0 / 1	0 / 0	0 / 1	0 / 2	-	-
	15	0 / 0	1 / 0	0 / 1	1 / 1	-	-	-	-	-	-
	17	0 / 0	0 / 1	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0
	20	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	22	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	23	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	26	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 0	0 / 0
	28	0 / 0	0 / 0	0 / 0	1 / -	-	-	-	-	-	-
	30	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	32	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	34	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	35	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	-
	38	0 / 0	2 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	39	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 1	2 / 2	-	-
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	04	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	06	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	09	0 / 0	1 / 0	0 / 0	0 / 0	0 / 1	0 / 1	0 / 0	0 / 1	2 / -	-
	11	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	13	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	16	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / -	-	-	-
	18	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	19	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	0 / 0
	21	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	24	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	25	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	27	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	29	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	31	0 / 1	1 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	33	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	2 / -	-	-	-
	36	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	37	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	-	-
	40	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Appetite Scores: 0 = Normal; 1, 2 = Abnormal

Attitude Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves Fed Colostrum from Control Dams	02	0 / 1	0 / 1	1 / 1	1 / 2	1 / 2	2 / 2	2 / 2	2 / 2	2 / 2	3 / -
	03	0 / 0	1 / 2	1 / 2	2 / 2	2 / 2	-	-	-	-	-
	05	0 / 0	0 / 1	2 / 2	1 / 2	1 / 1	2 / 2	1 / 2	1 / 2	2 / 2	2 / 2
	07	0 / 0	0 / 1	1 / 1	0 / 1	0 / 0	0 / 0	0 / 0	2 / 2	1 / 2	1 / 1
	10	0 / 0	0 / 0	1 / 2	1 / 1	0 / 2	2 / 2	2 / 2	1 / 1	2 / 2	-
	12	0 / 1	0 / 1	1 / 2	2 / 2	2 / 2	2 / 2	-	-	-	-
	14	0 / 0	1 / 1	1 / 2	1 / 2	1 / 2	2 / 2	2 / 2	2 / 2	-	-
	15	0 / 0	1 / 2	2 / 2	2 / 2	-	-	-	-	-	-
	17	0 / 0	0 / 1	2 / 2	2 / 2	2 / 2	2 / 2	1 / 1	2 / 2	2 / 2	2 / 2
	20	0 / 0	1 / 2	0 / 0	1 / 2	0 / 0	1 / 1	1 / 0	0 / 0	1 / 2	1 / 2
	22	0 / 0	2 / 2	1 / 2	1 / 2	1 / 2	0 / 1	0 / 0	0 / 1	0 / 0	0 / 0
	23	0 / 0	1 / 2	1 / 1	1 / 1	1 / 1	1 / 1	1 / 2	1 / 1	0 / 1	1 / 1
	26	0 / 0	1 / 2	2 / 2	2 / 2	1 / 0	2 / 2	0 / 0	0 / 0	0 / 1	1 / 1
	28	0 / 0	1 / 2	2 / 2	-	-	-	-	-	-	-
	30	0 / 0	2 / 2	1 / 1	2 / 2	0 / 1	0 / 0	1 / 2	2 / 2	2 / 2	1 / 2
	32	0 / 0	1 / 2	1 / 2	2 / 2	2 / 2	0 / 1	1 / 1	0 / 0	2 / 2	1 / 2
	34	0 / 0	0 / 0	1 / 2	2 / 2	1 / 2	1 / 1	1 / 1	1 / 2	1 / 2	0 / 1
	35	0 / 0	0 / 0	1 / 1	1 / 1	1 / 2	1 / 2	1 / 2	2 / 2	2 / 2	-
	38	0 / 0	1 / 2	2 / 2	1 / 1	0 / 0	1 / 2	1 / 2	1 / 2	1 / 1	1 / 2
	39	0 / 0	1 / 1	1 / 2	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	-	-
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	04	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2
	06	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	0 / 0
	09	0 / 0	1 / 1	0 / 1	0 / 0	2 / 2	1 / 2	2 / 2	1 / 2	3 / -	-
	11	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	0 / 0	0 / 0
	13	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	2 / 2	0 / 1	1 / 2	2 / 2	1 / 2
	16	0 / 0	0 / 1	0 / 0	1 / 2	2 / 2	2 / 2	3 / -	-	-	-
	18	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2	1 / 2	1 / 2
	19	0 / 0	0 / 1	1 / 2	1 / 2	0 / 0	0 / 0	0 / 0	1 / 2	1 / 2	2 / 2
	21	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	1 / 2	2 / 2	1 / 2	1 / 1	1 / 1
	24	0 / 0	1 / 2	1 / 2	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	25	0 / 0	1 / 2	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	1 / 1	0 / 1	1 / 2
	27	0 / 0	1 / 0	0 / 1	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	1 / 2	1 / 1
	29	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 1	0 / 1	1 / 1	1 / 0
	31	0 / 1	1 / 1	0 / 0	0 / 0	1 / 2	1 / 1	1 / 2	2 / 2	1 / 0	0 / 0
	33	0 / 0	0 / 0	0 / 2	0 / 0	1 / 1	2 / 2	3 / -	-	-	-
	36	0 / 0	0 / 0	0 / 0	0 / 1	0 / 1	1 / 2	0 / 1	1 / 1	0 / 1	0 / 1
	37	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	1 / 2	2 / 2	1 / 2	-	-
	40	0 / 0	0 / 1	0 / 1	0 / 1	0 / 1	0 / 0	0 / 0	0 / 1	0 / 1	0 / 0

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Attitude Scores: 0 = Normal; 1, 2, 3 = Abnormal

Dehydration Scoring:

Treatment Group	Animal ID	Days of observation post-challenge*									
		0 AM/PM #	1 AM/PM #	2 AM/PM #	3 AM/PM #	4 AM/PM #	5 AM/PM #	6 AM/PM #	7 AM/PM #	8 AM/PM #	9 AM/PM #
Calves Fed Colostrum from Control Dams	02	0 / 0	0 / 0	1 / 1	1 / 2	1 / 2	2 / 2	2 / 2	2 / 2	2 / 2	3 / -
	03	0 / 0	1 / 1	1 / 2	2 / 2	2 / 3	-	-	-	-	-
	05	0 / 0	0 / 0	2 / 2	1 / 2	1 / 1	1 / 2	1 / 2	1 / 2	2 / 2	2 / 2
	07	0 / 0	0 / 1	1 / 1	0 / 1	0 / 0	0 / 0	0 / 0	2 / 2	1 / 2	1 / 1
	10	0 / 0	0 / 0	1 / 2	1 / 1	0 / 2	2 / 2	2 / 2	1 / 1	2 / 2	-
	12	0 / 1	0 / 1	0 / 2	2 / 2	2 / 2	2 / 3	-	-	-	-
	14	0 / 0	1 / 1	1 / 2	1 / 2	1 / 2	2 / 2	2 / 2	2 / 2	-	-
	15	0 / 0	1 / 2	2 / 2	2 / 2	-	-	-	-	-	-
	17	0 / 0	0 / 1	2 / 2	2 / 2	2 / 2	2 / 2	1 / 1	2 / 2	2 / 2	2 / 2
	20	0 / 0	1 / 2	0 / 0	1 / 2	0 / 0	1 / 1	1 / 0	0 / 0	1 / 2	1 / 2
	22	0 / 0	2 / 2	1 / 2	1 / 2	1 / 2	0 / 1	0 / 0	0 / 1	0 / 0	0 / 0
	23	0 / 0	1 / 2	1 / 1	1 / 1	1 / 1	1 / 1	1 / 2	1 / 1	0 / 1	1 / 1
	26	0 / 0	2 / 2	2 / 2	2 / 2	1 / 0	2 / 2	0 / 0	0 / 0	0 / 1	1 / 1
	28	0 / 0	1 / 2	3 / 3	-	-	-	-	-	-	-
	30	0 / 0	2 / 2	1 / 1	2 / 2	0 / 1	0 / 0	1 / 2	2 / 2	2 / 2	1 / 2
	32	0 / 0	1 / 2	1 / 2	2 / 2	2 / 2	0 / 1	1 / 1	0 / 0	2 / 2	1 / 2
	34	0 / 0	0 / 0	1 / 2	2 / 2	1 / 2	1 / 1	1 / 1	1 / 2	1 / 2	0 / 1
	35	0 / 0	0 / 0	1 / 1	1 / 1	1 / 2	1 / 2	1 / 2	2 / 2	2 / 2	-
	38	0 / 0	1 / 2	2 / 2	1 / 1	0 / 0	1 / 2	1 / 2	1 / 2	1 / 1	1 / 2
	39	0 / 0	1 / 1	1 / 2	2 / 2	2 / 2	2 / 2	2 / 2	2 / 2	-	-
Calves Fed Colostrum from Vaccinated Dams	01	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	04	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2
	06	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	0 / 0
	09	0 / 0	1 / 1	0 / 1	0 / 0	2 / 2	1 / 2	2 / 2	1 / 2	3 / -	-
	11	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	0 / 0	0 / 0
	13	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	2 / 2	0 / 1	1 / 2	2 / 2	1 / 2
	16	0 / 0	0 / 1	0 / 0	1 / 2	2 / 2	2 / 2	3 / -	-	-	-
	18	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 2	1 / 2	1 / 2
	19	0 / 0	0 / 1	2 / 2	1 / 2	0 / 0	0 / 0	0 / 0	1 / 2	1 / 2	2 / 2
	21	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	1 / 2	2 / 2	1 / 2	1 / 1	1 / 1
	24	0 / 0	1 / 2	1 / 2	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
	25	0 / 0	1 / 2	0 / 0	0 / 0	0 / 1	0 / 0	0 / 0	1 / 1	0 / 1	1 / 2
	27	0 / 0	1 / 0	0 / 1	0 / 0	0 / 0	0 / 0	1 / 2	0 / 1	1 / 2	1 / 1
	29	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 1	1 / 1	0 / 1	1 / 1	1 / 0
	31	0 / 1	1 / 1	0 / 0	0 / 0	1 / 2	1 / 1	1 / 2	2 / 2	1 / 0	0 / 0
	33	0 / 0	0 / 0	0 / 2	0 / 0	1 / 1	2 / 2	2 / -	-	-	-
	36	0 / 0	0 / 0	0 / 0	0 / 1	0 / 1	1 / 2	0 / 1	1 / 1	0 / 1	0 / 1
	37	0 / 0	0 / 0	0 / 0	0 / 0	1 / 2	1 / 2	2 / 2	1 / 2	-	-
	40	0 / 0	0 / 1	0 / 1	0 / 1	0 / 1	0 / 0	0 / 0	0 / 1	0 / 1	0 / 0

*Day 0 = day of challenge

Animals were scored in the AM and PM (Score recorded as AM / PM)

- = Animal no longer on study

Fecal Scores: 0 = Normal; 1, 2, 3 = Abnormal

Study Type	Safety																																																																					
Pertaining to	All fractions																																																																					
Study Purpose	Demonstrate safety in cattle under field conditions																																																																					
Product Administration	Two doses administered intramuscularly (IM) with the first dose 6 weeks and second dose 3 weeks before scheduled calving																																																																					
Study Animals	Nine hundred fifty-two (952) 6-7-month pregnant animals in 3 geographic locations. About 700 animals were vaccinated, the remaining animals received a placebo control. Site 1: 374 (94 controls and 280 vaccinates) Site 2: 355 (116 controls and 239 vaccinates) Site 3: 221																																																																					
Challenge Description	N/A																																																																					
Interval observed after vaccination	Animals were observed individually for 28 days after first vaccination for injection site reactions and adverse events.																																																																					
Results	<div>Site 1:</div> <table><tr><td>Treatment Group</td><td>Depression</td><td>Injection site Swelling</td><td>Diarrhea</td><td>Ataxia</td><td>Abortion</td><td>Other</td></tr><tr><td>Controls</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Vaccinates</td><td>2*</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1**</td></tr></table> <div>*Animal 331 was reported to be depressed and sore (Study Day 1). Animal 388 was described as sore, sluggish, no appetite (Study Day 3). **Animal 067 experienced a cervical prolapse (Study Day 1).</div> <div>Site 2:</div> <table><tr><td>Treatment Group</td><td>Depression</td><td>Injection site Swelling</td><td>Diarrhea</td><td>Ataxia</td><td>Abortion</td><td>Other</td></tr><tr><td>Controls</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td></tr><tr><td>Vaccinates</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1*</td></tr></table> <div>* Dystocia and dead calf delivered (Study Day 24)</div> <div>Site 3:</div> <table><tr><td>Treatment Group</td><td>Depression</td><td>Injection site Swelling</td><td>Diarrhea</td><td>Ataxia</td><td>Abortion</td><td>Other</td></tr><tr><td>Controls</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td></tr><tr><td>Vaccinates</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1*</td></tr></table> <div>* Dystocia and dead calf delivered (Study Day 20)</div> <div>Only 2 animals had adverse events due to vaccination; depression/soreness in one and inappetence/soreness in the other. No injection site swellings, or other vaccine related local or systemic reactions, were reported.</div>							Treatment Group	Depression	Injection site Swelling	Diarrhea	Ataxia	Abortion	Other	Controls	0	0	0	0	0	0	Vaccinates	2*	0	0	0	0	1**	Treatment Group	Depression	Injection site Swelling	Diarrhea	Ataxia	Abortion	Other	Controls	0	0	0	0	1	0	Vaccinates	0	0	0	0	0	1*	Treatment Group	Depression	Injection site Swelling	Diarrhea	Ataxia	Abortion	Other	Controls	0	0	0	0	1	0	Vaccinates	0	0	0	0	0	1*
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