Systems to Reduce the Cost of Preconditioning Purchased Calves

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INTRODUCTION

Calves purchased from local sale barns have usually been severely stressed and exposed to disease. Few, if any, have been vaccinated or have adequate immunity to fully protect them from disease challenge. A good receiving program is essential to reduce sickness and death loss and to condition calves to perform adequately through the grazing period. Proper use and timing of immunizations and antibiotics are essential for animal health, but equally important is proper nutritional management. Branded commercial medicated feeds, fed ad libitum, can cost more than $40 per head for a 21-day preconditioning period. In contrast, several area producers reported less sickness and higher gains by turning calves out on ryegrass pasture after processing, rather than feeding supplements in a drylot.

The study reported in this paper was designed to compare three selected methods of preconditioning purchased calves. Two methods (RATION1 and RATION2) involved feeding mixed rations in a drylot, and the other grazing ryegrass (RYEGRASS).

EXPERIMENTAL PROCEDURES

A total of 192 heifer calves (three trials) were purchased during a 2- to 3-week period from local stockyards. Upon arrival, calves were fed hay free choice in a drylot and processed the next day. At processing, calves were tagged, dehorned, and vaccinated with BRSV VAC 4® (IBR, PI3, BVD, BRSV modified live virus), Vision 8® (8-way clostridial), and Presponse HM® (Pasteurella and Hemopholus). Micotil® 300 (tilmicosin phosphate, 300 mg/ml), an antimicrobial metaphylactic (4.5 mg per pound of body weight [10 mg/kg]), and Cydectin® (moxidectin) pour-on (to control internal and external parasites) were also administered to all calves. A booster vaccination of BRSV VAC 4® was administered within 2 to 4 weeks after arrival. Calves showing signs of clinical illness and/or elevated temperatures (above 103.5°F) were pulled and treated with Nuflor® (florfenicol, 300 mg/ml) antibiotic as per labeled directions.

After processing, equal numbers of calves were randomly assigned to one of the three preconditioning treatments. One group of calves received RATION1 (Table 1) and was fed a maximum of 10 pounds per head per day at a cost of 90 cents per head per day. Hay was fed ad libitum

Table 1. Preconditioning rations.

Ingredients	RATION1	RATION2
	lb/ton	*lb/ton*
Soybean meal, 48%	280	353
Soybean hulls		500
Molasses, cane	100	100
Cottonseed hulls	610	465
Corn, No. 2, ground shelled	970	492
Salt, trace mineralized	10	20
Limestone	10	10
Dicalcium phosphate	10	40
Dyna K, (KCl)	7	14
Vitamin A (4,000,000 IU/ton)	1	2
Bovatec 68 (68 g/lb)	1	2
Selenium premix (0.02% Se)	1	2
Total	2,000	2,000
Cost ($/ton)	179	186
Amount fed (lb/head/day)	10	5
Dry matter analysis		
Crude protein (%)	13.42	15.55
NEM (Mcal/lb)	1.68	1.63
NEG (Mcal/lb)	1.06	1.03
Calcium (%)	0.46	0.93
Phosphorus (%)	0.37	0.69

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after consumption of RATION1 reached the 10-pound daily rate (usually by the third day). The group receiving RATION2 (Table 1) was fed at the rate of 5 pounds per head per day at a cost of 47 cents per head per day. Hay was fed ad libitum once consumption of RATION2 reached the 5-pound target level (usually by the second day). The remaining calves were turned out on ryegrass pasture immediately after processing (RYEGRASS treatment). The RYEGRASS calves received a free-choice salt and mineral mix formulated to provide levels of Bovatec® and selenium equal to the other two treatments. Preconditioning was completed and final weights taken 21 days after the last calf was purchased. Data were analyzed using SAS GLM procedures. Trials were combined in a randomized complete block design with trials as blocks. The linear model included blocks, treatments, and interaction.

Results and Discussion

When data from all three of the trials were combined (Table 5), heifers on the RYEGRASS treatment had the highest average daily gain (ADG) (P>0.05). Average daily gains were 2.93 pounds in the RYEGRASS treatment, 1.86 pounds in the RATION1 treatment, and 1.97 pounds in the RATION2 treatment. ADG between RATION1 and RATION2 was not significantly different (P>0.05). There were no interactions between trial and treatment. Percent morbidity (sick pulls) was 3.03% for the RATION1 and RATION2 groups, but there were no sick pulls in the RYEGRASS group. There was no death loss in any of the treatment groups. Due to the small numbers of animals, no conclusions can be made about the effectiveness of treatments on sickness and death loss. The causes of these results are not addressed in this study. Further studies should be considered to determine if the reduced ADG and increased morbidity observed between RYEGRASS treatment and the drylot confinement treatments of this study are stress induced, a reflection of reduced feed intake, or a combination of both factors.

Estimated cost of feed or pasture for 30 days of preconditioning was $11, $26.94, and $14.17 per head for RYEGRASS, RATION1, and RATION2, respectively (Table 6). If the weight gain during the preconditioning programs is valued at $90 per hundredweight, then net monetary returns were $46.38 per head for RYEGRASS; $3.21, RATION1; and $18.25, RATION2 (Table 6). There was no significant difference in morbidity costs among groups. Retreatment costs were 23 cents for RATION1 and 66 cents for RATION2; however, these costs may be misleading because one calf in RATION2 (Table 2) was treated five times before being returned to its preconditioning group. There were no retreatment costs for the RYEGRASS group. These returns are heavily in favor of the RYEGRASS group due to a combination of superior ADG and reduced feed cost, because retreatment costs were minimal for all groups.

Pasture costs can vary widely. In this study, pasture cost was calculated at $110 per acre for 150 days of grazing with a two-head-per-acre stocking rate — $11 per head for 30 days. This cost was considered "representative" for south Mississippi. Costs for ryegrass pasture range from $100 per acre (South Mississippi Experiment Station, fixed costs and labor included) to $139 per acre (Agricultural Economics Department, 1999). Grazing days for ryegrass range from

Table 2. Animal performance under three preconditioning treatments, Trial 1, winter 1998-99.[1]

	RYEGRASS	RATION1	RATION2
	lb	*lb*	*lb*
Purchase weight	559	560	563
End weight (29 days[2])	638	591	609
ADG	2.71	1.05	1.61
Sickness (head)		1[3]	1[4]
Treatment ($/head)[5]		7.22	33.83

[1]Number = 22 (for each treatment).
[2]Weighted mean of days from purchase.
[3]Treated once with 16 ml of Nuflor®.
[4]Treated five times with 15 ml of Nuflor®.
[5]At $45.10 per 100 ml of Nuflor®.

Table 3. Animal performance under three preconditioning treatments, Trial 2, summer 1999.[1]

	RYEGRASS	RATION1	RATION2
	lb	*lb*	*lb*
Purchase weight	478	474	480
End weight (29 days[2])	572	551	542
ADG	3.88	3.24	2.58
Sickness (head)			1[3]
Treatment ($/head)[4]			7.22

[1]Number = 20 (for each treatment).
[2]Weighted mean of days from purchase.
[3]Treated once with 16 ml of Nuflor®.
[4]At $45.10 per 100 ml of Nuflor®.

90 days to 180 days in south Mississippi. Stocking rates range between 0.75 and 2.5 head per acre, depending upon animal size, supplementation on pasture, fertilization rates, rainfall, and temperatures. Tables 8 and 9 show that even with variation in pasture costs, days of grazing, and stocking rates, preconditioning on ryegrass pasture is still cost-effective.

Pasture preconditioning can be done any time pasture is available. This study was conducted using ryegrass pasture, which is usually available from December through April. Other research is needed to confirm if summer perennial grasses would perform as well. The price differential between the two drylot rations and ryegrass pasture should stay about the same.

Table 4. Animal performance under three preconditioning treatments, Trial 3, winter 1999-2000.[1]

	RYEGRASS	RATION1	RATION2
	lb	*lb*	*lb*
Purchase weight	577	583	569
End weight (29 days[2])	658	637	629
ADG	2.48	1.67	1.89
Sickness (head)		1[3]	
Treatment ($/head)[4]		6.77	

[1]Number = 22 (for each treatment).
[2]Weighted mean of days from purchase.
[3]Treated once with 15 ml of Nuflor®.
[4]At $45.10 per 100 ml of Nuflor®.

Table 5. Animal performance under three preconditioning treatments, Trials 1–3 combined.[1]

	RYEGRASS	RATION1	RATION2
	lb	*lb*	*lb*
Purchase weight	541 (53)	541 (56)	539 (49)
End weight (29 days)[2]	624 a (57)	594 b (59)	595 b (54)
Gain	83	53	56
ADG[2]	2.93 a (1.77)	1.86 b (2.21)	1.97 b (1.62)
Sickness (%)		3.03	3.03

[1]Number = 64 (for each treatment). Standard errors of the mean in parentheses.
[2]Means in the same row with different letters are different (P>0.05) using REGWQ mean separation from SAS.

Table 6. Per-head cost of preconditioning purchased calves for 30 days.

	RYEGRASS	RATION1	RATION2
	$	*$*	*$*
Pasture	11.00[1]		
Grain		26.85[2]	13.95[3]
Hay[4]		0.09	0.22
Total feed cost	11.00	26.94	14.17
Processing[5]	17.32	17.32	17.32
Retreatment[6]		0.23	0.66
Total cost	28.32	44.49	32.15
Value of gain[7]	74.70	47.70	50.40
Net gain[8]	46.38	3.21	18.25

[1]Pasture cost estimated by dividing the per-acre cost by the stocking rate and prorating for 30 grazing days. Ryegrass assumptions: $110 per acre for 150 days and a stocking rate of two head per acre = $11 per acre. See Tables 8 and 9.
[2]Grain RATION1 fed at 10 pounds per head daily ($179 per ton).
[3]Grain RATION2 fed at 5 pounds per head per day ($186 per ton).
[4]Hay intake calculated as total intake of 2.5% of body weight less grain ($50 per ton).
[5]Pharmaceuticals on receiving and booster (Table 7).
[6]Nuflor® treatment for combined trials.
[7]Gain from purchase multiplied by $90 per hundredweight.
[8]Value of gain less costs.

Table 7. Cost for pharmaceuticals.

Product	Indications	Cost per bottle	Doses	Cost per head
		$		$
Receiving				
Vision 8®	clostridials (8-way)	23.23	50	0.46
BRSV VAC 4®	IBR, PI3, BVD, BRSV modified live virus	8.59	10	0.86
Presponse HM®	pasteurella and hemopholus	98.39	50	1.97
Micotil®	antibiotic (100-ml bottle) [1]	95.00	12	7.92
Cydectin®	dewormer (1-liter bottle) [1]	113.00	40	2.83
Booster				
Vision 8®	clostridials (8-way)	23.23	50	0.46
BRSV VAC 4®	IBR, PI3, BVD, BRSV modified live virus	8.59	10	0.86
Presponse HM®	pasteurella and hemopholus	98.39	50	1.97
Total				17.32

[1]Dosage based on 550-pound body weight; Micotil at 1.5 ml per 100 pounds and Cydectin at 1 ml per 22 pounds.

Table 8. Per-head pasture costs for 30-day calf preconditioning period on ryegrass pasture with a two-head-per-acre stocking rate.

Total grazing days [1]	Pasture cost ($/acre) [2]				
	90	**100**	**110**	**120**	**130**
	$	$	$	$	$
90	15.00	16.67	18.33	20.00	21.67
120	11.25	12.50	13.75	15.00	16.25
150	9.00	10.00	**11.00**	12.00	13.00
180	7.50	8.33	9.17	10.00	10.83

[1]Calendar days from beginning to ending of grazing; preconditioning period included.
[2]Cost per head for 30 days prorated over total grazing days.

Table 9. Per-head pasture costs for preconditioning calves on ryegrass pasture with $110-per-acre pasture cost and 150 total grazing days.[1]

Days preconditioning	Stocking rate (head/acre) [2]				
	1.50	**1.75**	**2.00**	**2.25**	**2.50**
	$	$	$	$	$
20	9.78	8.38	7.33	6.52	5.87
25	12.22	10.48	9.17	8.15	7.33
30	14.67	12.57	**11.00**	9.78	8.80
35	17.11	14.67	12.83	11.41	10.27

[1]Calendar days from beginning to ending of grazing; preconditioning period included.
[2]Cost per head for days of preconditioning prorated over 150 days and $110 per acre.

IMPLICATIONS

The preliminary results gathered in this study appear to agree with the conclusion drawn by area producers: Preconditioning purchased calves on ryegrass is cost-effective because it reduces feed cost, increases ADG, and reduces morbidity. Unless pasture costs are higher and/or stocking rates are lower than normal, pasture is usually a very cost-effective option for preconditioning purchased calves.

Many producers would consider pasture as more of a stocker grazing cost than a preconditioning cost. Their intention is to graze the pasture for the entire season, and pasture establishment expense is the same whether calves are preconditioned in drylot or on pasture. They would simply look at the net impact of not having to buy preconditioning feed. Added profit would result from additional animal gains and reduced morbidity and mortality when placing animals directly on pasture.

There is a certain level of animal discomfort and stress associated with weaning, transportation, disruption of social structure, and administration of a health program. Reducing stress is a major component in reducing morbidity in purchased calves and may also increase ADG. Producers should make every attempt to return purchased animals to a familiar environment as quickly as possible. Two precautions are recommended for pasture preconditioning: (1) effective antibiotic and immunization injections immediately after purchase; and (2) pastures fenced for easy, nonstressful penning of sick calves when treatment is necessary.

Because some producers assemble stocker calves before grass is ready to graze, the $12.77 per head difference in feed cost between RATION1 and RATION2 becomes important. There are reduced feed costs for RATION2 without forfeiting animal gains.

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