Effect of Different Molasses Slurries on the Performance of Preconditioning Calves

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The use of molasses based supplements as a feedstuff in a preconditioning program for beef calves resulted in minimal improvement of gains over calves grazing bahiagrass pastures.

Summary

Three different commercially available molasses-based supplements were evaluated for their effects on the performance of preconditioning calves during the fall of 2002. One hundred and forty calves (mean body weight, 465 lb) were randomly allotted to one of four treatments. Treatments offered were: 1) 16% crude protein fortified molasses slurry, 2) 16% crude protein fortified molasses slurry plus Alimet® (a bypass methionine source), 3) 32% crude protein fortified molasses slurry, and 4) control (pasture only). Treatment groups grazed four bahiagrass pastures and were rotated between them weekly. Molasses slurries were offered ad libitum in lick tanks. Body weights were monitored weekly. Supplementation of calves with molasses increased (P<0.05) daily body weight gain as compared to control (0.004 lb/d vs -0.13 lb/d). Calves consumed equal amounts (P>0.10) of the 16% crude protein slurry (2.62 lb/d), the 16% crude protein plus Alimet® slurry (2.59 lb/d), and the 32% crude protein slurry (2.37 lb/d). Daily body weight gain for the trial was not different (P=0.17) among the 16% crude protein slurry (0.04 lb/d), the 16% crude protein plus Alimet® slurry (-0.01 lb/d), and the 32% crude protein slurry (-0.02 lb/d). The calves supplemented with the 16% crude protein slurry had a greater (P=0.01) daily gain than the control calves (0.04 vs 0.13 lb/d). Supplementation with molasses based liquid supplements increased calf weight gains over unsupplemented calves. However none of these products produced acceptable weight gains.

Introduction

Preconditioning calves has been around for several decades. Preconditioning means different things to different people. In general preconditioning is a process that involves weaning, vaccinating, and training calves to eat from a bunk that takes place over several weeks. Preconditioned calves are generally healthier and gain better in the feed yard compared to fresh weaned calves. In addition, many feed yards will pay premium prices for preconditioned calves. For producers to maximize their income from a preconditioning period, they need to optimize body weight gain and minimize feed costs.

Molasses is a high-energy, low-cost byproduct of the sugar industry that is readily available in the state of Florida. Molasses has been utilized to improve body weight gains of cattle on pasture. Alimet® is a methionine source that bypasses ruminal degradation and has been reported to increase body weight gains of cattle on high forage diets (Rodríguez, 2002). Rodríguez showed that yearling cattle supplemented with molasses containing Alimet® gained more weight than cattle supplemented with molasses alone. There are currently many commercially available molasses slurries on the market.

This study was designed to evaluate the effects of commercially available molasses slurries when supplemented to preconditioning calves on pasture.

Materials and Methods

This study was conducted at the University of Florida's Santa Fe Beef Research Unit from September 3 to October 15, 2002 (43 d). One hundred and forty fall-born Angus and Brangus calves (72 steers and 68 heifers; 465 lb mean body weight) were weaned and assigned randomly by body weight and sex to one of four supplement treatment groups (35 head/treatment). Treatments consisted of 1) 16% crude protein (CP) fortified molasses slurry (M16), 2) 16% CP fortified molasses slurry plus Alimet® (ALI), 3) 32% CP molasses slurry (M32), and 4) pasture only (CON). All calves were weighed and sorted into supplement treatment groups at weaning (1 d) and placed in a dry lot for 5 d. Calves were given ad libitum access to bermudagrass hay, water, and the assigned supplement treatment during the 5 d in dry lot. After five days, each treatment group was placed on a four ac bahiagrass pasture with two-week regrowth (mean CP= 7%). Treatment groups were rotated among the four pastures every seven d. Pasture quantities decreased after four wk and calves had to be placed into four new bahiagrass pastures for the remaining 10 d of the trial. Calves were allowed ad libitum access to water and a complete mineral mixture during the trial and adequate shade was provided.

Molasses supplements were fed ad libitum in commercially available lick tanks throughout the entire trial. Lick tanks were weighed and filled twice weekly to determine supplement intake. Full body weights on calves were taken weekly to determine gains. All data were analyzed using the GLM function of SAS, with a model that included treatment, sex, breed, and treatment by sex, treatment by breed, and sex by breed interactions. Least squared means were determined and values were declared different if P<0.05.

Results

Daily supplement intake per calf was not different (P>0.1) for ALI (2.59 lb/hd), M32 (2.37 lb/hd), and to M16 (2.62 lb/hd). Total supplement consumed for the trial was 3,860; 3,800; and 3,478 lb/pen for M16, ALI, and M32 respectively.

Average daily gain (ADG) of calves for the entire trial was different (P=0.01) between M16 and CON calves (0.04 vs -0.13 lb/d, Table 1). The ADG of ALI (-0.01 lb/d) and M32 (-0.02 lb/d) was not different (P=0.37) as compared to M16 and CON. During the first week while the calves were in drylot, the ADG for the calves was -1.02, -1.5, -0.58, and

-1.39 lb/d for M16, ALI, M32, and CON respectively. Weight loss is to be expected at that time due to the high stress that the calves experience because of weaning. Average daily gains for the ALI calves (0.04 lb/d) were not different compared to (P=0.16) CON calves (-0.15 lb/d), but greater (P<0.05) than M16 and M32 (mean= 0.24 lb/d) calves during the first 21 d of the trial. During the last 21 d of the trial, the M16 (0.35 lb/d) and the M32 (0.2 lb/d) calves had greater (P<0.05) ADG compared to the CON (-0.11 lb/d) and ALI (-0.07 lb/d) calves. The Brangus calves did have a greater (P<0.001) ADG (0.18 lb/d), over the entire trial, compared with the Angus calves (-0.24 lb/d) regardless of the treatment assigned. The poor ADG could be a result of several factors. The lack of quality forage for the calves and a decrease in the quantity of the forage as the trial progressed are two possible factors of the poor performance. The poor performance of the control calves directs us to this conclusion.

Costs incurred during the preconditioning process are included in Table 2. The total cost of preconditioning varied from $14.24 to $23.06 per calf. If the market value of fresh weaned calves (465 lb) was $80 per hundred weight (cwt), the break even price of the preconditioned calves would need to be $84.58, $85.14, $84.96, and $84.08/cwt for M16, ALI, M32, and CON respectively, when total costs are considered (Table 3). To break even at $80/cwt calves would have had to gain 0.42, 0.67, 0.69, and 0.67 lb/d for M16, ALI, M32, and CON respectively. Preconditioned calves theoretically should have more value due to the fact that they are often healthier and perform better in the feed yard which can command a higher selling price. If the calves did receive a $5/cwt premium for being preconditioned all of the calves would have shown a profit over the non-preconditioned calves except for the ALI calves. Preconditioning of calves is a management tool that can increase profits and calf performance when used in the correct situations. The profitability of preconditioning will depend on the market price received for calves, weight gain over the preconditioning period, and the total cost of preconditioning.

Literature Cited

Rodríguez, E.R., M.S. Thesis. 2002. University of Florida, Gainesville.

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Table 1. Average daily gains of calves preconditioned with different molasses supplements.

	Treatment			
Days	CON	M16	ALI	M32
1-7	-1.39	-1.02	-0.58	-1.5
1-21	-0.15[ab]	-0.24[a]	0.04[b]	-0.24[a]
22-42	-0.11[b]	0.35[a]	-0.07[b]	0.20[a]
1-42	-.013[b]	0.04[a]	-0.11[b]	-0.01[ab]

[a,b]Means with different superscripts within rows differ (P<.05).

Table 2. Itemized expenses of preconditioning calves with different molasses supplements.

	Cost/hd			
	CON	M16	ALI	M32
Vaccines[a]	$5.47	$5.47	$5.47	$5.47
Anthelmintic[b]	$1.73	$1.73	$1.73	$1.73
Hay[c]	$0.86	$0.86	$0.86	$0.86
Pasture[d]	$0.68	$0.68	$0.68	$0.68
Fertilizer[e]	$1.37	$1.37	$1.37	$1.37
Pasture pesticide[f]	$1.70	$1.70	$1.70	$1.70
Mineral[g]	$0.29	$0.29	$0.29	$0.29
Supplement $/ton	$0.00	$116.50	$126.60	$128.70
Supplement $/hd	$0.00	$6.42	$6.87	$6.39
Labor[h]	$0.00	$1.95	$1.95	$1.95
Interest[i]	$2.14	$2.14	$2.14	$2.14
Total costs	$14.24	$22.61	$23.06	$22.58

[a]Calves received two vaccinations prior to weaning and a MLV after weaning.
[b]5 ml dose of injectable avermectin dewormer per calf.
[c]One roll of Coastal bermudagrass hay (average 1,000 lb/roll) per treatment @ $30.00/roll.
[d]Eight acres per treatment @ $30.00/acre/yr for 36 d.
[e]50 lb/acre @ $240.00/ton.
[f]1 qt/acre of Sevin XLR @ $29.80/gal.
[g]50 lb/treatment @ $10.00/50 lb bag.
[h]15 min/d @ $6.50/hr.
[i]5% interest for 42 d on the value of the calves sold at weaning ($396.60).

Table 3. Economic evaluation of preconditioning calves with different liquid molasses supplements.

	Non-preconditioned	CON	M16	ALI	M32
Supplement cost	-	-	$4.30	$3.95	$2.96
Total costs	-	$14.24	$22.61	$23.06	$22.58
Calf wt at weaning, lb	462	462	462	462	462
Calf wt at marketing, lb	462	456.5	463.7	461.2	461.6
Breakeven ($/lb)[b]	-	$0.84	$0.85	$0.85	$0.85
Income/head @ $0.80/lb[c]	$369.60[a]	$365.20	$370.96	$368.96	$369.28
Profit (loss) over non-preconditioned calves[d]	-	(-$18.64)	(-$21.25)	(-$23.70)	(-$22.90)
ADG required during the preconditioning period to break even @ $0.80/cwt		0.42	0.67	0.69	0.67
Income/head @ $0.85/lb[e]	-	$388.03	$394.15	$392.02	$392.36
Profit (loss) over non-preconditioned calves[f]	-	$4.19	$1.94	-$0.64	$0.18

[a]Assuming non-preconditioned calves weighed the same as preconditioned calves at weaning (462 lb).
[b]The cost of preconditioning plus the income received if calves were marketed at weaning ($369.60) divided by the total of the market weight plus the gain/loss realized from preconditioning.
[c]The income received if calves were marketed at $0.80/lb multiplied by the market weight.
[d]The income received if calves were marketed at $0.80/lb multiplied by the market weight minus the total of income received if calves were marketed at weaning ($369.60) and the cost of preconditioning.
[e]The income received if calves were marketed at $0.85/lb multiplied by the market weight.
[f]The income received if calves were marketed at $0.85/lb multiplied by the market weight minus the total of income received if calves were marketed at weaning ($369.60) and the cost of preconditioning.