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Summary

Cattle were transitioned from RAMP to a finishing diet over 27 or 28 days by decreasing RAMP (100 to 0%) and increasing finisher (0 to 100%) gradually over 4 steps or rapidly in fewer days and with fewer steps. Following adaptation, cattle were fed a common diet until slaughter. Grain adaptation treatment did not affect performance or carcass characteristics. Cattle can transition from RAMP to a finishing ration containing 47.5% Sweet Bran® in fewer days with fewer step diets without negatively affecting performance compared to more gradual transition from RAMP to a finishing diet.

Introduction

Using RAMP to transition cattle to a finishing ration has been shown to increase ADG and improve feed efficiency over the entire finishing period when compared to traditional grain adaptation with alfalfa hay (*2012 Nebraska Beef Cattle* Report, p.85). We hypothesized that improved performance during the finishing period might be attributed to a reduction in subclinical acidosis throughout the trial. A metabolism study found grain adaptation with RAMP compared with a traditional program does not appear to alter ruminal pH or pH variation during the adaptation period or during the first seven days on a finishing ration. Although adaptation with RAMP does not change ruminal pH, a reduction in subclinical acidosis during finishing may explain improvements in performance that cannot be explained by differences in energy intake during adaptation. The objective of this study was to determine if cattle can be transitioned from RAMP to a finishing ration more rapidly in fewer days and with fewer step diets compared with a traditional adaptation program.

Table 1. Dietary composition (%) on a DM basis and days fed for the control adaptation programs which involved blending RAMP with a finishing diet containing 25% Sweet Bran (CON25) or a 47.5% Sweet Bran finishing diet (CON47.5).

Days fed	1-4	5-10	11-16	17-22	23-28
Adaptation	100:0	75:25	50:50	25:75	0:100
CON25					
RAMP	100	75	50	25	—
Alfalfa hay	—	1.9	3.8	5.6	7.5
High moisture corn	—	15.6	31.2	46.8	62.5
Sweet Bran	—	6.3	12.5	18.8	25
Supplement[1]	—	1.2	2.5	3.8	5
CON47.5					
RAMP	100	75	50	25	—
Alfalfa hay	—	1.9	3.8	5.6	7.5
High moisture corn	—	10	20	30	40
Sweet Bran	—	11.9	23.7	35.6	47.5
Supplement[1]	—	1.2	2.5	3.8	5

[1]Supplement formulated to provide 25 g/ton Rumensin and 12 mg/lb thiamine on a DM.

Procedure

Yearling crossbred steers (n = 390; BW = 752 ± 31 lb) were limit-fed a 1:1 ratio of Sweet Bran and alfalfa hay fed at 2% of BW (DM) to minimize variation in gut fill. Weights were measured over two consecutive days (days 0 and 1) to determine initial BW. Using BW measurements obtained on day 0, steers were separated into three weight blocks, stratified by BW, and assigned randomly within strata to one of 40 feedlot pens, with 9 or 10 steers per pen.

Treatments consisted of grain adaptation programs (27 or 28 days) involving blends of RAMP and a finishing diet. A control adaptation program involved decreasing RAMP and increasing a 25% Sweet Bran finishing diet (25% Sweet Bran, 62.5 % high moisture corn (HMC), 7.5% alfalfa hay (AH), and 5% dry supplement) in 5 steps (100:0, 75:25, 50:50, 25:75, and 0:100 RAMP to finishing diet) fed for 4, 6, 6, 6, and 6 days, respectively (CON25; Table 1). Four remaining adaptation programs involved decreasing RAMP and increasing inclusion of a 47.5% *Sweet Bran* finishing diet (47.5% *Sweet Bran,* 40% HMC, 7.5% AH, and 5% dry supplement). Two programs consisted of 5 steps (100:0, 75:25, 50:50, 25:75, and 0:100 RAMP to finishing diet) fed for either 4, 6, 6, 6, and 6 days (CON47.5; Table 1) or 10, 1, 1, 1 and 14 days (3-1d; Table 2). The final two programs consisted of either 4 steps (100:0, 67:33, 33:67 and 0:100 RAMP to finishing diet) fed for 10, 2, 2, and 14 days (2-2d; Table 2) or 3-steps (100:0, 50:50, and 0:100 RAMP to finishing diet) fed for 10, 4, and 14 days (1-4 days; Figure 1). RAMP, all step rations, and the first finishing ration contained 25 g/ton of DM Rumensin and 12 mg/lb thiamine (DM).

Table 2. Percentage (DM) of 47.5% Sweet Bran finishing ration (finisher 1) blended with RAMP for respective days during grain adaptation for treatments 2-2 day step, 1-4 day step, and 3-1 day step. Following finisher 1, cattle were fed a common diet (finisher 2) until slaughter.

Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29-146
2-2 days	RAMP										32		67		Finisher 1														Finisher 2
1-4 days	RAMP										50				Finisher 1														Finisher 2
3-1 days	RAMP										25	50	75		Finisher 1														Finisher 2

Table 3. Feedlot performance and carcass characteristics of cattle adapted to grain using rapid or traditional grain adaptation with RAMP.

Item	Treatment					SEM	*P*-value
	CON25	CON47.5	2-2 day	1-4 day	3-1 day		
Performance							
Initial BW, lb	749	750	750	749	751	31.0	0.56
Final BW, lb[1]	1439	1440	1443	1449	1430	16.2	0.84
DMI, lb/day							
36 days	25.5	25.3	24.8	25.3	25.2	0.41	0.62
Final	26.5	26.0	26.3	26.6	26.0	0.36	0.39
ADG, lb							
36 days	4.23	4.44	4.29	4.56	4.35	0.32	0.85
Final	4.73	4.72	4.75	4.79	4.65	0.11	0.77
F:G[2]							
36 days	6.02	5.69	5.77	5.78	5.54	—	0.81
Final	5.58	5.49	5.51	5.53	5.58	—	0.81
Carcass traits							
LM area, in[2]	14.6	15.0	14.8	14.9	15.0	0.20	0.32
12 rib fat, in	0.52	0.50	0.59	0.53	0.58	0.04	0.11
Marbling[4]	542	518	538	550	537	12.0	0.11
Liver abscess,%	9.0	9.0	5.1	7.7	7.7	—	0.90

[1]Final BW was calculated from HCW using a common dressing percentage of 63%.
[2]Statistics performed on G:F, inverse of G:F presented
[3]400 = Slight, 500 = Small, 600 = Modest

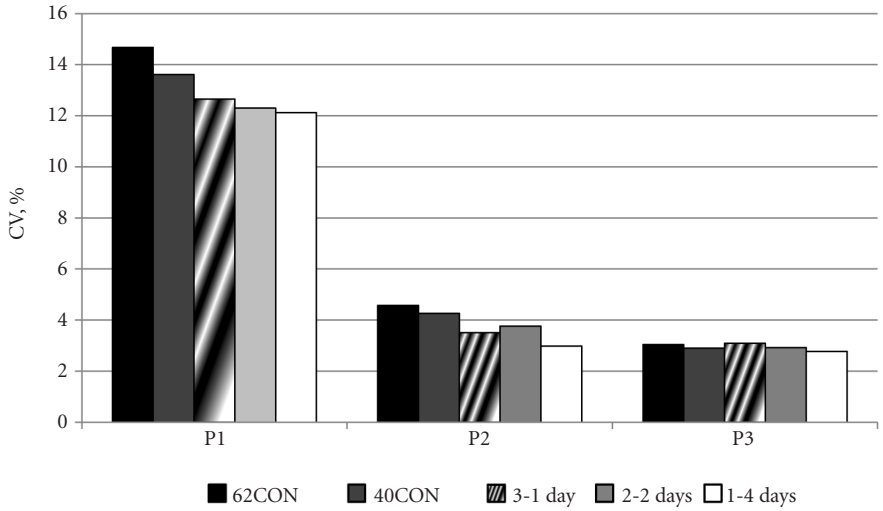

Figure 1. DMI variation (shown as CV) over three time periods (P1: all days before feeding a common finishing diet; days 1-27 or 1-28, P2: first six days of finishing diet 1, and P3: first six days on the common finishing diet). Treatments shown left to right in chart: CON25, CON40, 3-1days, 2-2 days, and 1-4 days.

Following adaptation, a common finishing diet (25% Sweet Bran, 22.5% modified distillers grains with solubles, 40% HMC, 7.5% AH, and 5% dry supplement which was formulated to provide 30 g/ton Rumensin and 90 mg/steer daily Tylan on a DM basis was fed for the remainder of the feeding period. After cattle were on a common finishing diet for 8 days (day 36), BW were collected to evaluate performance over the adaptation period, and steers were implanted with Revalor®-S.

On day 146, cattle were transported to a commercial abattoir (Greater Omaha Packing, Omaha, Neb.) to be harvested. Hot carcass weight (HCW) and liver abscess scores were obtained on the day of slaughter. Following a 48-hour chill, USDA marbling score, 12th rib fat thickness, and LM area were recorded. Carcass adjusted performance was calculated using a common dressing percentage (63%) to determine final BW, ADG and F:G.

Performance and carcass characteristics were analyzed using the MIXED procedure of SAS (SAS Inst. Inc., Cary, N.C.) Pen was the experimental unit, treatment was a fixed effect, and weight block was treated as a random effect. Treatment comparisons were made using pair-wise comparisons when the F-test statistic was significant at an alpha level of $P = 0.10$. Among day DMI variance and DMI for each pen were analyzed for three time periods (all days before feeding a common finishing diet; days 1-27 or 1-28, the first six days of finishing diet 1, and the first six days on the common finishing diet) using the MIXED procedure of SAS. Mean variance and DMI for each pen were then used to calculate CV for DMI for each period. Prevalence of liver abscesses was analyzed using the GLIMMIX procedure of SAS.

Results

Adaptation program did not affect DMI during the adaptation period ($P = 0.63$; Table 3) or over the entire feeding period ($P = 0.39$). Daily gain and F:G were similar among treatments on d 36 ($P > 0.81$) and over the entire finishing period ($P > 0.77$). Carcass traits were not affected by adaptation method. Variation (CV) in DMI for time periods during and after grain adaptation are summarized in Figure 1. Among day DMI variance over the adaptation period (days 1-28 or 1-27; P2) was greater for CON25 than all other adaptation treatments ($P < 0.05$). Intake variance was greater for CON47.5 when compared to 1-4 days and 2-2 days and tended ($P = 0.09$) to be greater when compared to 3-1 days during P2.

Although individual intake variation is masked in a pen setting, among day intake variation is a measure of subacute acidosis available in a feedlot setting. Shorter, more abrupt transitions between RAMP and finishing ration actually reduced intake variation and therefore may reduce subacute acidosis. Cattle fed RAMP for 10d can transition to a finishing ration containing 47.5% Sweet Bran in fewer days and with fewer step diets without negatively affecting performance.

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