Impact of Rate of Gain during backgrounding on Feedlot Performance, Carcass Characteristics, and Meat Quality

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Why is this research important?

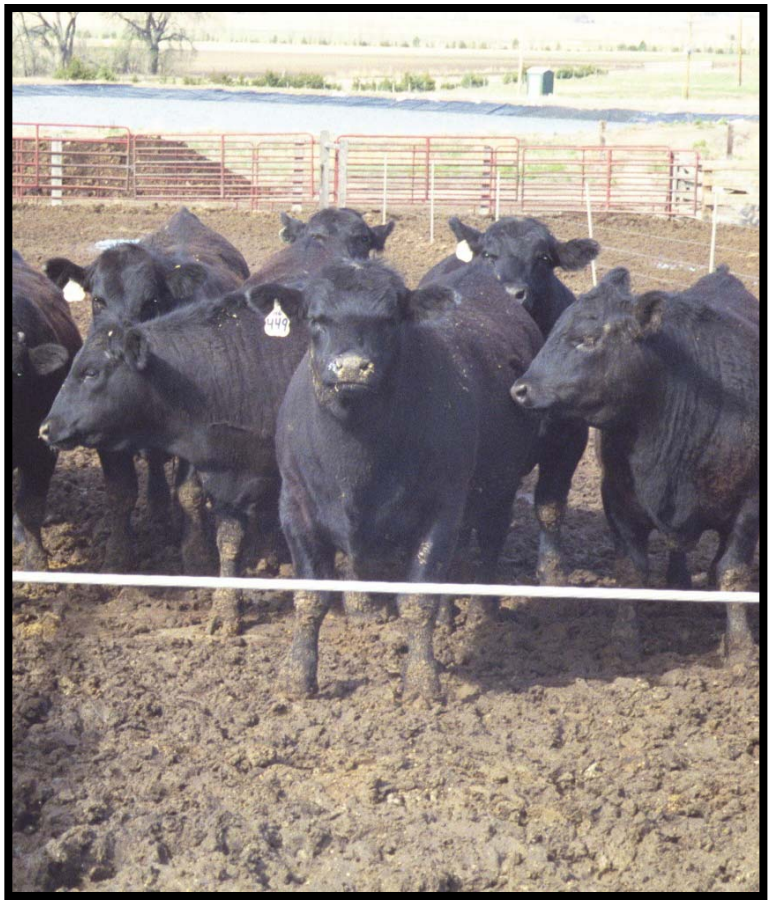
- **Calves are generally sold during the fall (500-600 lbs)**
- **Interest to background calves has increased**

Introduction

- **Little research exists which examines the effect of rate of gain during the backgrounding period on feedlot performance, carcass characteristics, and meat quality**

Introduction

- **This study was aimed to determine the effect of rate of gain during the backgrounding period on subsequent feedlot performance and carcass characteristics**



Materials and Methods

- **79 Angus and Angus × Simmental bred steer calves**
- **Initial body weight was 507 ± 170 lbs**
- **Calves were 197 d of age**
- **Calves were weighed, stratified by body weight, and allotted randomly to one of 10 pens**

Materials and Methods

- **Pens were assigned to one of two dietary treatments**
  - **High gain (HG) target ADG 2.75 lbs**
  - **Low gain (LG) target ADG 2.00 lbs**
- **A 14d adaptation period allowed calves to acclimate to silage diets**
- **Steers were fed dietary treatments for a period of 70d**

Diet Composition

	% DM basis	
Ingredient	**HG**	**LG**
Barley silage	43.9	52.5
Whole shell corn	47.4	39.0
Supplement pellet[a]	5.2	6.2
Deccox medicated crumbles	1.3	1.6
Soybean meal, 44%	1.3	---
Calcium carbonate	0.9	0.7

[a] 27% Commercial supplement (as fed): 27% CP, min Ca 2.0%, min P 0.7%, min K 0.7%, min Vit A 27,000 IU·lb-1, min Vit D3 1,700 IU·lb-1, min Vit E 100 IU·lb-1, and Rumensin 225 mg·lb-1

Materials and Methods

- **Cattle were finished at the University of Nebraska Panhandle Research and Extension Center feedlot in Scottsbluff, Nebraska**
- **Cattle were fed for 135d**
- **Diets contained 7.6% corn silage, 78.3% dry-rolled corn, 6.8% alfalfa hay, 7.3% supplement (as fed basis)**

Materials and Methods

- **Cattle were slaughtered in Greeley, Colorado**
- **Carcass data was collected after a 48h chill**
- **Rib-eye steaks (2 inch thick) were removed from each steer for Warner-Bratzler shear force, and sensory taste panel analysis**

Materials and Methods

- **Steaks were aged for 14d, and frozen until analyzed**
- **Steaks were thawed and cooked**

- **Panelist were trained prior to the taste panel to determine tenderness, juiciness, flavor and off flavor**

Statistical Analysis

- **Data was run as a completely random design**
- **Pen was used as the experimental unit**
- **Means were considered significant if $P < 0.05$**

Results

Backgrounding Performance

	Treatment[a]			
	HG	LG	SEM[b]	*P*-value
Initial weight (lbs)	579.02	576.11	5.15	0.7005
End weight (lbs)	825.71	778.73	9.08	0.0064
ADG (lbs/day)	3.69	3.08	0.08	0.0009
DMI (lbs)	20.90	18.41	0.22	0.0001
Gain : feed	0.18	0.17	0.01	0.2251
Feed cost/head	$ 110.68	$ 95.95	0.26	0.0001
Feed cost/lb gain	$ 0.44	$ 0.45	0.01	0.3937

[a] HG = high gain, LG = low gain

[b] SEM = Standard error of the mean

Feedlot Performance

	Treatment[a]			
	HG	LG	SEM[b]	*P*-value
Initial weight	825.71	778.73	9.08	0.0064
February weight	988.72	944.06	8.50	0.0053
April weight	1221.50	1171.71	8.71	0.0033
Final weight	1277.92	1239.01	12.46	0.0580
ADG	3.35	3.40	0.08	0.6806
DMI	22.74	23.63	0.20	0.0136
Gain : feed	0.14	0.14	0.01	0.5805
Feed cost/pen	$ 2408.28	$ 2638.92	134.56	0.2601
Feed cost/lb gain	$ 0.66	$ 0.77	0.02	0.0111

[a] HG = high gain, LG = low gain

[b] SEM = Standard error of the mean

Carcass Results

	Treatment[a]			
	HG	LG	SEM[b]	*P*-value
HCW[b]	811.48	786.77	7.90	0.0580
REA (in^2)[c]	12.99	12.98	0.17	0.9846
12^{th} rib fat (in)	0.52	0.52	0.02	0.9138
USDA YG	2.74	2.65	0.12	0.6513

[a] HG = high gain, LG = low gain

[b] SEM = Standard error of the mean

[C] HCW = Hot carcass weight

[d] REA = Rib eye area

Meat Samples

	Treatment[a]			
	HG	LG	SEM	*P*-value
	----------Taste Panel ----------			
Tenderness [b]	5.39	5.48	0.12	0.6064
Juiciness [c]	4.96	5.17	0.13	0.2761
Flavor [d]	5.16	5.17	0.05	0.8752
Off Flavor [e]	3.98	3.97	0.01	0.4290
	----- Warner-Bratzler Shear Force -----			
Tenderness (lb)	8.03	7.98	0.13	0.7662

[a] HG= high gain, LG = low gain

[b] 1 = extremely tough, 2 = very tough, 3 = moderately tough, 4 = slightly tough, 5 = slightly tender, 6 = moderately tender, 7 = very tender, 8 = extremely tender

[c] 1 = extremely dry, 2 = very dry, 3 = moderately dry, 4 = slightly dry, 5 = slightly juicy, 6 = moderately juicy, 7 = very juicy, 8 = extremely juicy

[d] Extremely bland, 2 = very bland, 3 = moderately bland, 4 = slightly bland, 5 = slightly flavorful, 6 = moderately flavorful, 7 = very flavorful, 8 = extremely flavorful

[e] 1= no off flavor, 2 = moderate off flavor, 3 = slight off flavor, 4 = no off flavor

Conclusions

- **Steers consuming HG diets during the backgrounding period consumed more, and gained faster**

- **Diets did not effect feedlot performance, carcass characteristics, and meat quality**
- **More research is needed to further define backgrounding and finishing recommendations**

Questions?

Thanks to Dean Wang for providing the cattle for this experiment