THE EFFECTS OF AGE, DATE ON FEED AND CORN PROCESSING METHOD ON FEEDLOT PERFORMANCE.

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Story in Brief

Yearling steers (117 head) and fall born calves (112 head) were used to determine the effects of age, date on feed (July vs September) and ration (dry rolled vs steam-flaked) on feedlot performance. Yearlings entering the feedlot in July had been grazed on tallgrass prairie for 100 days while calves entering in July had no grazing history. In September, yearlings had grazed for 156 days while calves had grazed for 56 days during late summer. Calves were fed 21 days longer than yearlings while steers entering the feedlot in July were fed 14 days longer than steers started in September. Although average daily gain was not different between treatments, steam-flaking tended to improve average daily gain of cattle started in July. Averaged across ration, calves started on feed in September tended to gain better than calves started in July (1.47 vs 1.41 kg/day, respectively), however yearlings started in July tended to gain better than yearlings started in September (1.47 vs 1.40 kg/day respectively. Calves started in July consumed .63 kg/day less than calves started in September while yearlings consumed similar amounts (9.3 kg/day) across date on feed. Calves ate .77 kg/day less ($P<.05$) than yearlings. Steam-flaking improved ($P<.05$) feed efficiency by 10% over dry rolling for steers started on feed in July but processing had no effect for steers started in September. Averaged over corn processing method and date on feed, calves were 10% more ($P<.05$) efficient than yearlings.

(Key Words: Feedlot Performance, Grazing, Age, Corn Processing, Beef Steers.)

Introduction

Steam flaking has been shown to improve feedlot gains and feed efficiencies, however, most of the steam flaking research was done over fifteen years ago. Most cattle fed today are younger and inherently more efficient than

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cattle fed ten to fifteen years ago. Researchers at Oklahoma State University have noticed consistent and significant trends for cattle that are grazed longer or latter into the season to have poorer feed efficiencies during the finishing phase (Gill et al 1991). The present study was conducted to try and determine what interactions may be involved due to differences in age, date of entry into the feedlot, and corn processing method on cattle performance and to isolate the key factors involved in decreased feedlot efficiency.

Materials and Methods

One hundred seventeen yearling steers and one hundred twelve fall born calves were used to determine the effects of age, date of entry into the feedlot, and corn processing method on cattle performance and feed efficiency. Spring born yearling steers originating from western Kansas and coming off of wheat pasture were received at the Pawhuska research station (Pawhuska, Ok) in March. Upon arrival cattle were routinely processed and vaccinated. After a 28 day receiving period, the cattle were re-vaccinated, implanted with Synovex S and placed on tallgrass prairie pastures. On July 27 all cattle were re-weighed, re-implanted and randomly assigned to either continue grazing for the remainder of the season or placed in a feedlot. Cattle returning to pasture were implanted with Synovex S and cattle going to the feedlot were implanted with Revalor. Prior to this time fall born weanling calves from northern Texas were purchased and backgrounded for 28 days. After the 28 day receiving period calves were randomly assigned to either go on to pasture with the remaining yearlings for late season grazing or go directly to the feedlot. All calves were implanted with Synovex S regardless of treatment. Both calves and yearlings were shipped to the Panhandle State University research station (Goodwell, Ok) for the feedlot phase of the study. Upon arrival at the feedlot calves and yearlings were randomly assigned to either a steam flaked corn (SF) or dry rolled corn (DR) ration. Rations were identical except for processing method (Table 1.). On September 21, 56 days later the remaining half of calves and yearlings on pasture were shipped to the feedlot and randomly assigned to either a SF or DR ration Within both ages and backgrounding regimes cattle were divided based on their weights coming off pasture, representing a heavy, medium and light weight replication. Calves were re-implanted with Revalor at either 56 or 28 days on feed for July and September entry dates respectively. All animals were weighed on 28 day intervals and slaughtered on one of three kill periods when a commercial packer buyer deemed them acceptable.

Average daily gain (ADG) was calculated by subtracting the adjusted in weight from the carcass adjusted final live weight and dividing by the number of days on feed (DOF). Adjusted in weight was determined by taking the off pasture weight and shrinking it 3%. The carcass adjusted final weight was calculated by taking the mean dressing percentage for each kill group and

Table 1. Composition of diets (dry matter basis).

Ingredient	Rolled corn	Steam flaked corn
Alfalfa hay	9.00	9.00
Dry rolled corn	81.5	-----
Steam flaked corn	------	81.5
Cane molasses	4.00	4.00
Meat & bone meal	.50	.50
Cottonseed Meal	1.71	1.71
Limestone 38%	.55	.55
Salt	.30	.30
Rumensin 60	.0225	.0225
Tylan 100	.0045	.0045
Vitamin A-40M	.0040	.0040
Urea	.50	.50
Trace mineral	.0125	.0125

Calculated Composition:

Nutrients	DM %
NEm Megcal / cwt	95.52
NEg Megcal /cwt	61.58
TDN %	88.11
Crude protein %	12.64
Potassium %	.72
Calcium %	.52
Phosphorous %	.35
Magnesium %	.186
Sulfur %	.18
Cobalt ppm	.203
Copper ppm	11.4
Ironppm	54.2
Manganese ppm	33.7
Selenium ppm	.26
Zinc ppm	49.9

dividing it by the respective individual hot carcass weights. Feed intake is expressed as a daily average over the entire feeding period on a pen basis. Feed efficiency (FE) is expressed as pounds of feed per pound of gain and was calculated by dividing feed intake by ADG.

The experimental design of this study was a 2 x 2 x 2 factorial arrangement of treatments. Data were analyzed by GLM procedure of SAS with the main effects being age, date on feed, ration and all appropriate interactions. Pens were experimental units.

Results and Discussion

Results are illustrated on a calf and yearling basis in Tables 2 and 3 and a date on feed * ration interaction table in Table 4. Calves were fed 21 days longer than yearlings due to 111 lb lighter weight entering the feedlot (604 vs 715) respectively. Steers entering the feedlot in July were fed on average 14 days longer than steers entering in September due to a 52 lb lighter in weight (633 vs 685) respectively. ADG was not significantly different between treatments however, steam flaking tended to improve (date on feed * ration P=.18) ADG for cattle started in July vs September (3.32 vs 3.16) respectively while Dry rolling tended to be more advantageous in September (3.23 vs 3.08). This is probably due to the increased amount of available energy in steam-flaked corn being more important in the hot months when cattle are consuming less total

Table 2. Performance data for calves.

		July	September	Mean
Item	Ration[a]			
ADG, lb	SF	3.23	3.17	3.20
	DR	3.03	3.38	3.21
mean		3.13	3.28	3.20
Intake, lb	SF	18	19	19
	DR	18	20	19.2
mean		18[b]	20[c]	19[bc]
Feed/gain,lb	SF	5.6	6.0	5.8
	DR	6.1	5.9	6.0
mean		5.8	6.0	5.9

[a] DR = dry rolled corn ; SF = steam flaked corn.
[bc] means within same row with different supperscripts differ ($P < .05$)

Table 3. Performance data for yearlings.

Item	Ration[a]	July	September	Mean
ADG, lb	SF	3.40	3.15	3.28
	DR	3.13	3.07	3.10
mean		3.27	3.11	3.19
Intake, lb	SF	21	21	21
	DR	21	21	21
mean		21	21	21
Feed/gain. lb	SF	6.0	6.5	6.3
	DR	6.7	6.8	6.7
mean		6.4	6.6	6.5

[a] DR = dry rolled corn; SF = steam flaked corn.

Table 4. Average daily gain and feed effeciency for the date in * ration interaction term (P < .09).

	July		September	
Item	DR[a]	SF[a]	DR	SF
ADG, lb	3.08	3.32	3.23	3.16
Feed efficiency, lb	6.4[b]	5.8[c]	6.4[b]	6.3[b]

[a] DR = dry rolled corn ; SF = steam flaked corn.
[b,c] means within same row with different superscripts differ by P < .05.

amounts of feed. Averaged across ration, calves started on feed in September tended to gain better (Age * date on feed P=.18) than calves started in July (3.28 vs 3.13, respectively), however yearlings started in July tended to gain better than yearlings started in September (3.27 vs 3.11) respectively. Calves started in July had no grazing history where calves in started in September had 56 days of grazing this could have allowed them to increase their capacity and eat more feed upon entering the feedlot. However, this trend does not appear in the older yearling cattle which suggests that only a minimal grazing period is necessary to

maximize feedlot gains. An age * date on feed interaction (P<.08) for daily dry matter intake was detected. Calves started in July consumed 1.4 lb/d less than less than calves started in September while yearlings ate similar amounts (20.5 lb/d) across dates on feed. These results are consistent with the ADG results in that the 56 grazing period for the calves increased feedlot DMI, but whether the yearlings were grazed for 100 or 156 days did not affect DMI. Averaged over dates on feed and rations Calves consumed 1.7 lb/day less (P<.05) than yearlings. There was a date on feed * ration interaction (P=.08) for feed efficiency. Steam-flaking improved (P<.05) feed efficiency by 10% over dry rolling for steers started on feed in July but processing method had no effect for steers started in September. Again, as was illustrated for ADG steam-flaking significantly improves feed efficiency only for cattle started on feed in the hot months due to an improved ADG while maintaining DMI Averaged over corn processing method and date on feed calves were 10 % more (P<.05) efficient than yearlings. Feed efficiency for yearlings was not significantly affected by the date on feed which represents either an early grazing season for July or a season long grazing period for September, like other studies reported by Gill et al (1992). A possible explanation for this is the growth implantation regimes. All animals in this study were implanted with Revalor which combines estrogens and androgens where the studies reported by Gill et al. were only implanted with estrogens.

Literature Cited

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