

COMPARISON OF ARKAN WHEAT WITH MILL RUN HARD RED WINTER WHEAT ON PERFORMANCE OF FEEDLOT STEERS

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Story in Brief

Seventy two yearling steers averaging 823 lb were fed a high-wheat ration consisting of either Arkan or mill-run hard red winter wheat over a 140 day trial. Gain and efficiency of feed use tended to be greater for steers fed the mill-run wheat diet. The percent of steers grading choice was reduced with the Arkan wheat diet from 63.9% to 38.9%. The calculated metabolizable energy content of the Arkan wheat diet was lower than that of the mill-run wheat diet. The calculated metabolizable energy values of the two wheats were 3.06 and 3.16 mcals/kg for Arkan and mill-run wheat.

(Key Words: Feedlot, Steers, Arkan Wheat, Hard Red Winter Wheat.)

Introduction

Recent research has indicated that hard red winter wheat can replace other grains in finishing beef cattle diets and lower the cost of gain when the price for the wheat is low (Martin et al., 1985, 1986). Arkan wheat is a variety of wheat developed as a hard red winter wheat. However, parental strains include some soft red winter wheat. This parentage has created difficulty in classifying wheat by visual inspection. The kernel characteristics of Arkan wheat vary. Hence, it is graded as hard red winter wheat by some inspectors but as soft red winter wheat by others. The objective of this research was to determine if Arkan wheat had comparable feeding value to mill-run hard red winter wheat for beef cattle fed feedlot rations. Feeding Arkan wheat would provide one outlet to merchandise Arkan wheat which would avoid the problems of visually classifying bread wheat.

Materials and Methods

Seventy-two crossbred steers sired by Limousin bulls and out of Hereford/Angus/Brahman cows (0, 1/4 or 1/2 Brahman) were weighed on trial at Goodwell, Oklahoma on April 1, 1986. These steers had grazed winter wheat pasture at El Reno, Oklahoma since November, 1985. Prior to the start of the trial, the steers were blocked into three breed groups of 24 head each. Each breed group was further divided into four partially covered pens of six head each with a 2 x 2 factorial of treatments being randomly assigned to each group. Two dietary treatments, hard red winter wheat vs Arkan wheat, were provided either ad libitum or

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at 85% of ad libitum consumption. The limit feeding results are presented elsewhere in this publication.

The concentrate ration consisted of rolled wheat, cottonseed hulls, a pelleted supplement, and molasses, and was fed for the entire 149 day trial (Table 1). Dehydrated alfalfa pellets and cottonseed hulls were used to dilute the ration to 60 percent concentrate to start the cattle on feed. These roughages were decreased sequentially in three steps until the cattle were on their final ration by 28 days on feed. All cattle were fed ad libitum for the first 21 days of the study. Amounts of feed offered to cattle being restricted were calculated from amounts consumed by pens with ad lib access to feed over the two previous weeks.

Steers were weighed full on days 28, 56, 84 and 112 individually. On day 140, the steers were weighed by pen because some animals were too large for the individual scales. Steers were trucked 70 miles to Booker, Texas on day 149 of the trial (August 28, 1986) for slaughter, and carcass data were obtained. The data was analyzed using a general linear model with breed type, wheat type and feed treatment (ad libitum vs 85% of ad libitum) as main effects. All two-way interactions were included in the model. No significant interactions between wheat type and feed treatment were observed on any of the criteria evaluated, so only the main effects of feed treatment are reported in this paper.

Results and Discussion

Carcass adjusted daily gains (Table 2) were 5.7% lower with the Arkan than the mill-run wheat diet (2.98 vs 2.81 lb/day). Live weight gains were reduced by 2.8% ($P < .05$) with the feeding of Arkan wheat (2.90

Table 1. Steer ration composition, dry matter basis.

Ingredient	Ration Sequence			
	1	2	3	4 ^a
	----- % -----			
Rolled wheat (mill-run or Arkan)	51	61	71	81.45
Cottonseed hulls	20	15	10	9.55
Alfalfa, dehy-pellets	20	15	10	-----
Molasses	4	4	4	4
Pelleted supplement	5	5	5	5

	Supplement Composition, % of DM			
Alfalfa meal	2.95			
Cottonseed meal	.50			
Calcium carbonate	.81			
Urea	.40			
Salt	.30			
Monensin, 60 g/lb	.02			
Vitamin A, 30000 IU/g	.01			
Tylan, 40 g/lb	.01			

^aFormulated to contain 2.85 mcal ME/kg, 82.7 mcal NEm/cwt, 57.7 mcal NEg/cwt, .033 g monensin/kg, .01 g tylan/kg, 3300 IU Vit A/kg, 13.5% crude protein, .78% potassium, .50% calcium and .38% phosphorus.

Table 2. Effect of wheat type on steer performance.

	Arkan	Hard Red	SEM
Number of steers	36	36	
Weight, lb:			
Initial	826	821	1.1
56 days	1026	1025	6.0
112 days	1200	1207	8.7
140 days	1272	1278	1.7
Daily gains, lb:			
0-56	2.84	2.92	.09
57-140	2.81	2.89 ^b	.07
0-140, live	2.82 ^a	2.90 ^b	.01
0-149, carcass	2.81	2.98	.08
Daily feed, lb DM:			
0-56	17.26	17.15	.42
57-140	28.66	28.67	.08
0-140, live	24.10	24.06	.13
0-149, carcass	24.34	24.31	.12
Feed/Gain:			
0-56	6.11	5.92	.18
57-140	10.20	9.95	.23
0-140, live	8.54	8.30	.07
0-149, carcass	8.65	8.17	.23
Metabolizable energy, mcal/kg	2.82	2.90	.06
Estimated grain ME ^C	3.06	3.16	

^{ab}Means in the same row with different superscripts differ ($P < .05$).

^CCalculated by subtracting ME values for other dietary ingredients.

vs 2.82 lb/day). Daily gains tended to be reduced during both the first and second half of the trial with the feeding of Arkan wheat. Feed intakes of the two diets were similar. Hence, feed efficiency tended to be superior for the mill-run hard red winter wheat (8.17 vs 8.65 lb feed/lb gain). The calculated ME value of the diet tended to be lower

Table 3. Effect of wheat type on steer carcass parameters.

	Arkan	Hard Red	SEM
Carcass wt, lb	772	784	8.4
Dressing %	63.2	63.9	.65
Rib eye area	13.70	13.78	.22
KHP, %	2.21	2.24	.05
Fat thickness, in	.29 ^c	.37 ^d	.02
Marbling score ^e	12.06	12.58	.26
Percent choice	38.9 ^a	63.9 ^b	.20
Yield	2.21	2.43	.09

^e12=slight plus, 13=small minus

^{ab}Means in the same row with different superscripts differ ($P < .05$).

^{cd}Means in the same row with different superscripts differ ($P < .10$).

with the Arkan wheat ration (2.90 vs 2.82 mcal/kg). The estimated grain ME were 3.06 and 3.16 mcal/kg for Arkan and mill-run hard red winter wheat, respectively. These are slightly lower than those values listed by the NRC (1984) for hard red winter wheat (3.22 mcal/kg) and the value calculated (3.31 mcal/kg) by Martin et al. (1986). Fat thickness at the twelve rib was reduced ($P<.08$) with the feeding of Arkan wheat (.37 vs .29 in) and the percent of steers grading choice was reduced from 63.9% to 38.9% with Arkan wheat ($P<.02$). In summary, it appears that the ME value of Arkan wheat was lower than that of hard red winter wheat which in turn slightly reduced feedlot performance and carcass merit (Table 3).

Literature Cited

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