

Jackson County Heifer Development Project Summary

A.S. Leaflet R1444

Tony Harvey, ISU extension beef/dairy specialist

Summary

The heifer development project was a five year project conducted on the site of the former Jackson County Farm north of Andrew, Iowa, for four years and on an area producer's farm for the fifth year. Heifers arrived around December 1 each year and the average number of heifers each year was 43 with a low of 37 and high of 47. After a 30+ day warm-up period the heifers were put on a 112-day test from early January to late April. They were fed a shelled corn and legume-grass hay ration consisting of between 13% and 14% crude protein and a range of .44 to .58 megacal/pound of NEg over the five years. During the 112-day test heifers gained 1.86, 1.78, 1.5, 1.63 and 2.2 pounds per day, respectively, for years 1992 through 1996. The actual average breeding weight was less than the target weight in three years by 5, 12 and 22 pounds and exceeded the target weight in two years by 17 and 28 pounds. Estrus synchronization used a combination of MGA feeding and Lutalyse injection. Heifers were heat detected and bred 12 hours later for a three-day period. On the fourth day, all heifers not bred were mass inseminated. Heifers then ran with the clean-up bull for 58 days. The average synchronization response rate during the project was 79%. The overall pregnancy rates based on September pregnancy averaged 92%. The five year average total cost per head for heifer development was \$286.18 or about \$.85 per day. Feed and pasture costs averaged 61% of the total costs.

Introduction

This project was a cooperative effort involving the Andrew Jackson Demonstration Farm Corporation, the Jackson County Cattlemen's Association and ISU Extension. In 1996 Paul Schwager, an area producer who has continued the heifer development program as a private enterprise, agreed to follow the same management program and share the data collected so a five year summary of the project could be done. This was the final year of the project.

The purpose of this project was to demonstrate:

1. feeding and health programs that grow heifers to target weights for satisfactory breeding and calving performance,
2. methods of monitoring heifer development (growth rate, condition score, pelvic measurement, pregnancy testing),
3. expected progeny differences (EPD) to select bulls that sire calves with low birth weights but above average growth rate,
4. estrus synchronization technique and AI breeding,

5. feasibility of developing replacement heifers as a commercial enterprise,
6. substantiate the costs of heifer development.

Materials and Methods

The number of heifers included in the project in 1996 totaled 45 and compares with the five year average of 43 head. Four producers provided the cattle for 1996. In past years four to ten producers and the Andrew Jackson Demonstration Farm board have provided cattle. There was a 460-pound spread in delivery weights in 1992. Consequently, these heifers were fed in two groups until pasture time. The heifers in the past four years were more uniform in weight (285, 290, 310 and 300 pound spreads, respectively) and were fed in one group.

The heifers were fed a corn and hay diet along with mineral and salt. The hay was a legume-grass mixture packaged in large round bales and stored inside. The starting diet in 1992 contained 13% crude protein (100% dry matter basis) and had a NEg of .48 megacal/pound. In addition, the light group of heifers in 1992 received approximately .33 pounds per day of an all natural commercial protein supplement. The 1993, 1994 and 1996 heifers were also started on a 13% crude protein (100% dry matter basis), but received a NEg of .58 megacal/pound in 1993 and .44 megacal/pound in 1994 and 1996. The 1995 starting ration contained 14% crude protein and had an NEg of .54 megacal/pound.

The heifers were fed in a solid concrete lot with access to loafing sheds open to the south. Salt and mineral were provided free choice. Heifers were dewormed, poured for lice, and given booster shots for Hemophilus, IBR, PI-3, BVD, Blackleg, and Pasteurella.

AI sires consisting of Angus, Red Angus, and Salers were offered to consignors. The AI sires had to be in the top 15% of their breed for EPD birthweight and calving ease. They needed a minimum EPD accuracy of .75. An Angus clean-up bull was rented for use until early August. The breeding season lasted 64 days.

Estrus synchronization was accomplished by feeding MGA at .5 mg/hd/day for 14 days. Seventeen days later, the heifers were injected with Lutalyse. Starting the next day and continuing for three days, heifers were detected for standing heat and inseminated 12 hours later. On the fourth day, heifers not detected in heat were mass inseminated. All heifers ran with the clean-up bull for 58 days. This procedure was followed each year except for 1995 when a second injection of Lutalyse was used because 16 head showed no sign of heat. During the next four days eight more were identified in heat and bred and the remainder were mass inseminated on the fourth day.

Results and Discussion

Starting information is presented in Table 1. The average heifer weights coming in varied no more than 62 pounds over the five years of the project, and frame scores were similar. The 1995 heifers carried more condition than

the heifers in previous years. Average birth dates varied by up to 11 days between years. The 1993 to 1996 groups of heifers were more uniform in starting weight, having a weight spread of no more than 310 pounds compared with 460 pounds in 1992.

A frame-score-adjusted mature weight was projected for the heifers (Table 2). Example frame scores of 3.0, 5.0 and 7.0 would project to 1,030, 1,180 and 1,330 pounds, respectively. Breeding target weight was assumed to be 70% of projected mature weight.

Table 3 shows weight gains and average breeding weights. The 1996 heifers were 28 pounds over target breeding weight, which compares with five under for 1992, 17 over for 1993, 12 under for 1994, and 22 under for 1995. The 1996 heifers gained 2.2 pounds during the 112-day test period, which compares with the five year project average of 1.79 pounds. The gains on pasture were variable from year to year reflecting weather variations, grazing intensity and pasture quality. More intensive rotational grazing management was used with the heifers in 1994 and 1995.

Table 4 shows the synchronized response rates. The 1996 rates were 83% and compare with an average of 79.4% for the five years of the project. The overall pregnancy rates were similar each year.

Table 5 outlines the heifer development costs. The total cost in 1996 was \$301.01 over the 336 days. This compares

with the five year average of \$286.18. Cost per head per day averaged \$.85 for the project. Feed and pasture costs represented 68% of the total costs in 1996 and compares with 61% for the project. Yardage costs generally declined during the five year period. Bedding was included in the yardage costs for 1996.

The average corn price per bushel was \$3.78 in 1996. This compares with \$2.56 in 1992, \$2.20 in 1993, \$2.65 in 1994 and \$2.31 in 1995. This resulted in the lowest ration cost per ton of dry matter of \$82.02 in 1993 and the highest of \$105.80 in 1996 and compares with the project average of \$88.64 (Table 6). The 1996 heifers consumed 17.5 pounds of dry matter per head per day, which compares with the project average of 16.4 pounds. There was a range from 14.8 up to 18.4 pounds per head per day over the five year period.

Acknowledgments

The author wishes to thank Floyd Peters, Paul Schwager, Rich Kunde, Eldon Hoerschelman, Dr. M. Pitcher, Ron Irvin, Rich Hainstock, the board of the Andrew Jackson Demonstration Farm Corporation, and the board of the Jackson County Cattlemen's Association for their assistance and cooperation in this project.

Table 1. Starting information.

	Year					Project Ave.
	1992	1993	1994	1995	1996	
Initial weight, lb	552	614	584	580	555	577
Frame height, in	45.5	46.2	45.9	46.1	44.9	45.7
Frame score	5.3	5.5	5.3	5.9	5.4	5.5
Condition score	4.3	4.8	4.8	5.5	5.2	4.9
Avg. birth date	4-1	3-25	3-21	3-27	4--1	3-27

Table 2. Projected target weights.

	Year					Project Ave.
	1992	1993	1994	1995	1996	
Estimated mature wt., lb	1200	1216	1205	1251	1207	1216
Breeding target wt., lb	840	851	844	875	845	851

Table 3. Performance data.

	Year					Project Ave.
	1992	1993	1994	1995	1996	
Daily gain by period						
Warm-up, lb	1.16	.86	.8	--	1.21	1.00
112-day test, lb	1.86	1.78	1.5	1.63	2.2	1.79
Pre-pasture, lb	.95	1.06	1.95	.70	.75	1.08
Pasture, lb	.91	.60	1.3	1.17	.77	.95
Breeding wt., lb	835	868	832	853	873	852
Breeding wt. minus target wt., lb	-5	+17	-12	-22	+28	-1
Adj. 365-day pelvic size, sq cm	168	190	173	175	195	180

Table 4. Reproduction results.

	Year					Project Ave.
	1992	1993	1994	1995	1996	
No. heifers removed early	1	1	2	0	1	1
No. heifers at breeding	37	43	44	47	45	43
Sync. estrus response rate, %	70.2	81.4	79.5	83	83	79.4
Overall pregnancy rate, %	94.6	93.0	91.0	91.5	91.1	92.2

Table 5. Heifer development costs.

Item	Year					Project Ave.
	1992	1993	1994	1995	1996	
Days in drylot	186	194	186	177	181	185
Drylot feed, \$/hd	143.38	108.98	131.62	112.07	159.21	131.05
Drylot yardage, \$/hd	66.96	48.31	43.92	40.17	43.96	48.66
Pasture yardage, \$/hd	13.08	16.46	11.04	12.98	10.18	12.75
Days on pasture/stalks	157	150	157	149	155	154
Pasture/stalks, \$/hd	39.16	39.01	45.61	46.26	45.26	43.06
Vet med, individual treatment, \$/hd	14.25	13.19	16.58	15.11	13.68	14.57
Pregnancy exam and pelvic area, \$/hd	3.50	3.00	3.96	4.36	2.67	3.50
Synchron. cost, \$/hd	3.33	3.86	4.70	6.08	4.51	4.49
Semen, \$/hd	13.54	12.56	9.18	15.03	12.00	12.46
Cleanup bull, \$/hd	13.51	11.63	11.37	10.64	8.89	11.21
Misc. exp., \$/hd (tags, bedding, etc)	5.62	5.42	4.03	6.44	65	4.43
Total cost, \$/hd	316.33	262.42	282.01	269.14	01.01	286.18

Table 6. Feed summary.

	Year					Project Ave.
	1992	1993	1994	1995	1996	
Days in drylot	186	194	186	177	181	185
Drylot feed cost, \$/hd	143.38	108.98	131.62	112.07	159.21	131.05
Ration cost/ton DM, \$	86.50	82.02	85.52	83.39	105.80	88.64
NEm/lb DM	.70	.76	.72	.76	.77	.74
Total ration DM/hd, lb	3315	2719	3059	2689	3195	2995
Ration DM for maint., lb/hd 1435	1439	1379	1484		1408	1429
Ration DM for gain, lb/hd	1880	1280	1718	1230	1787	1579
Corn DM/hd/day, lb	6.7	6.7	7.8	7.0	8.4	7.3
Hay DM/hd/day, lb	11.4	8.1	8.6	8.2	9.1	9.1
Supp. DM/hd/day, lb	.3	--	--	--	--	
Total DM/hd/day, lb	18.4	14.8	16.4	15.2	17.5	16.4