

1997

Jackson County Heifer Development Project Update

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Extension Number: ASL R1339

Recommended Citation

Harvey, Tony, "Jackson County Heifer Development Project Update" (1997). *Beef Research Report, 1996*. 17.
http://lib.dr.iastate.edu/beefreports_1996/17

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Abstract

The heifer development project took place the past four years on the site of the former Jackson County Farm north of Andrew, Iowa. Heifers arrived around December 1 with 38 heifers delivered for 1992, 44 for 1993, 46 for 1994, and 47 for 1995. 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 .48, .58, .44, and .54 megacal/pound of NEg respectively for the years 1992 - 1995. During the 112-day test heifers gained 1.86, 1.78, 1.5, and 1.63 pounds per day respectively for years 1992 through 1995. The 1995 heifers averaged 853 pounds at breeding (22 pounds under target weight). This compares with previous years in which the breeding weight was less than target weight in two years by 5 and 12 pounds and exceeded the target weight in one year by 17 pounds. Estrus synchronization used a combination of MGA feeding and Lutalyse injection. Heifers were heatdetected 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 cleanup bull for 58 days. The synchronization response rate in 1995 was 83%, which compares with the three year previous average of 77%. The overall pregnancy rates based on September pregnancy exams were 94.6% in 1992, 93% in 1993, 91% in 1994, and 91.5% in 1995. Development costs for the 326 days in 1995 totaled \$269.14 per heifer. This compares with the average of \$286.92 for the three previous years. The four-year average total cost per head for heifer development was \$282.48, or about \$.84 per day. Feed and pasture costs represented 58% of the total costs, or \$.49 per day.

Keywords

ASL R1339

Disciplines

Animal Sciences

Jackson County Heifer Development Project Update

A.S. Leaflet R1339

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Summary

The heifer development project took place the past four years on the site of the former Jackson County Farm north of Andrew, Iowa. Heifers arrived around December 1 with 38 heifers delivered for 1992, 44 for 1993, 46 for 1994, and 47 for 1995. 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 .48, .58, .44, and .54 megacal/pound of NEg respectively for the years 1992 - 1995. During the 112-day test heifers gained 1.86, 1.78, 1.5, and 1.63 pounds per day respectively for years 1992 through 1995. The 1995 heifers averaged 853 pounds at breeding (22 pounds under target weight). This compares with previous years in which the breeding weight was less than target weight in two years by 5 and 12 pounds and exceeded the target weight in one year by 17 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 cleanup bull for 58 days. The synchronization response rate in 1995 was 83%, which compares with the three year previous average of 77%. The overall pregnancy rates based on September pregnancy exams were 94.6% in 1992, 93% in 1993, 91% in 1994, and 91.5% in 1995. Development costs for the 326 days in 1995 totaled \$269.14 per heifer. This compares with the average of \$286.92 for the three previous years. The four-year average total cost per head for heifer development was \$282.48, or about \$.84 per day. Feed and pasture costs represented 58% of the total costs, or \$.49 per day.

Introduction

This project was a cooperative effort involving the Andrew Jackson Demonstration Farm Corporation, Jackson County Cattlemen's Association, and ISU Extension.

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; and
6. substantiation of the costs of heifer development.

Materials and Methods

The number of heifers included in the project in 1995 totaled 47. This compares with 37, 43, and 46 in previous years. Five producers and the Andrew Jackson Demonstration Farm board provided the cattle for 1995. In past years, seven to ten producers 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 three years were more uniform in weight (285, 290, and 310 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 and 1994 heifers also were 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. 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 milligrams per head per 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, but in 1995, 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 data appear in Table 1. The average heifer weights coming in varied no more than 62 pounds over the four years, and frame scores were similar. The 1995 heifers carried more condition than the heifers in previous years. Average birthdates varied by up to 11 days among years. The 1993 to 1994 groups of heifers were more uniform in starting weight, with a weight spread of no more than 310 pounds compared to 460 pounds in 1992.

A frame-score-adjusted, mature weight was projected for the heifers in 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 1995 heifers were 22 pounds under target weight, which compares with 5 under for 1992, 17 over 1993, and 12 under for 1994. The 1995 heifers gained 1.63 pounds during the 112-day test period, which compares to an average of 1.72 pounds for the previous three years. The gains on pasture were variable from year to year, reflecting variations in weather and pasture quality.

Table 4 shows the synchronized response rates. The 1995 rates were 83%. This compares with 70% in 1992, 81% in 1993, and 79.5% in 1994. The overall pregnancy rates were similar each year.

Table 5 outlines the heifer development costs. The total cost in 1995 was \$282.48 over the 339 days. This compares with the previous three-year average of 286.92. The yardage bill per head has decreased each year of the project.

The average corn price per bushel was \$2.31 in 1995. This compares with \$2.56 in 1992, \$2.20 in 1993 and \$2.65 in 1994. This resulted in a lower cost per ton of dry matter in 1993 and 1995 compared to 1992 and 1994 (Table 6). In addition, the 1995 heifers consumed 15.2 pounds of dry matter per head per day, which compares with the average of the previous three years of 16.5 pounds. There was a range from 14.8 to 18.4 pounds per head per day over the four-year period.

The four-year average total cost per head for heifer development was \$282.48, or about \$.84 per day. Feed and pasture costs represented 58% of the total costs, or \$.49 per day.

Acknowledgments

The author wishes to thank Floyd Peters, Paul Schwager, Rich Kunde, Eldon Hoerschelman, Dr. M. Pitcher, 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				4-Yr. Ave.
	1992	1993	1994	1995	
Initial weight, lb	552	614	584	580	583
Frame height, in	45.5	46.2	45.9	46.1	45.9
Frame score	5.3	5.5	5.3	5.9	5.5
Condition score	4.3	4.8	4.8	5.5	4.8
Avg. birth date	4-1-91	3-25-92	3-21-93	3-27-94	3-26-95

Table 2. Projected target weights.

	Year				4-Yr. Ave.
	1992	1993	1994	1995	
Estimated mature wt., lb	1200	1216	1205	1251	1218
Breeding target wt., lb	840	851	844	875	853

Table 3. Performance data.

	Year				4-Yr. Ave.
	1992	1993	1994	1995	
Daily gain by period					
Warm-up, lb	1.16	.86	.8	--	.94
112-day test, lb	1.86	1.78	1.5	1.63	1.7
Pre-pasture, lb	.95	1.06	1.95	.70	1.12
Pasture, lb	.91	.60	1.3	1.17	1.0
Breeding wt., lb	835	868	832	853	747
Breeding wt. minus target wt., lb	-5	+17	-12	-22	-6
Adj. 365-day pelvic size, sq cm	168	190	173	175	177

Table 4. Reproduction results.

	Year				4-Yr. Ave.
	1992	1993	1994	1995	
No. heifers removed early	1	1	2	0	1
No. heifers at breeding	37	43	44	47	43
Sync. estrus response rate, %	70.2	81.4	79.5	83	78.5
Overall pregnancy rate, %	94.6	93.0	91.0	91.5	92.5

Table 5. Heifer development costs.

	Year				4-Yr. Ave.
	1992	1993	1994	1995	
Days in drylot	186	194	186	177	186
Drylot feed, \$/hd	143.38	108.98	131.62	112.07	124.02
Drylot yardage, \$/hd	66.96	48.31	43.92	40.17	49.84
Pasture yardage, \$/hd	13.08	16.46	11.04	12.98	13.39
Days on pasture/stalks	157	150	157	149	153
Pasture/stalks, \$/hd	39.16	39.01	45.61	46.26	42.51
Vet med, individual treatment, \$/hd	14.25	13.19	16.58	15.11	14.79
Pregnancy exam and pelvic area, \$/hd	3.50	3.00	3.96	4.36	3.71
Synchron. cost, \$/hd	3.33	3.86	4.70	6.08	4.50
Semen, \$/hd	13.54	12.56	9.18	15.03	12.58
Cleanup bull, \$/hd	13.51	11.63	11.37	10.64	11.79
Misc. exp., \$/hd (tags, bedding, etc)	5.62	5.42	4.03	6.44	5.38
Total cost, \$/hd	316.33	262.42	282.01	269.14	282.48

Table 6. Feed summary.

	Year				4-Yr. Ave.
	1992	1993	1994	1995	
Days in drylot	186	194	186	177	186
Drylot feed cost, \$/hd	143.38	108.98	131.62	112.07	124.02
Ration cost/ton DM, \$	86.50	82.02	85.52	83.39	84.36
NEm/lb DM	.70	.76	.72	.76	.73
Total ration DM/hd, lb	3315	2719	3059	2689	2946
Ration DM for maint., lb/hd	1435	1439	1379	1484	1434
Ration DM for gain, lb/hd	1880	1280	1718	1230	1527
Corn DM/hd/day, lb	6.7	6.7	7.8	7	7.0
Hay DM/hd/day, lb	11.4	8.1	8.6	8.2	9.1
Supp. DM/hd/day, lb	.3	--	--	--	
Total DM/hd/day, lb	18.4	14.8	16.4	15.2	16.2