North Dakota State University * Dickinson Research Extension Center
1133 State Avenue, Dickinson, ND 58601 Voice: (701) 483-2348 FAX: (701) 483-2005

Winter Growth and Breed Production Comparison of First Generation Heifers

D. G. Landblom and J. L. Nelson

One of the major segments of the Dickinson Experiment Station's beef cow efficiency study is to evaluate the winter growth and production efficiency of each experimental breed. This overall study has been undertaken to provide cattlemen with information relative to beef cow efficiency that has been conducted in southwestern North Dakota. This station doesn't have the land bases or animals to evaluate a large number of biologically different breeds, but does have the capability of evaluating a small number of crossbred cow types that will be representative in performance to many of the combinations possible in North America.

As stated in the previous discussion, "Feedlot Breed Comparison of First Generation Steers", the breeding model presented here is designed to develop crossbred brood cow types that are biologically diverse which will maximize heterosis when crossed to unrelated terminal sire breeds. The first generation breeding scheme is shown in Table 1.

Winter growth performance, age and weight at puberty, first service conception rate and weaning weight of calves from these calves as first calf heifers are being evaluated in this phase of the overall cow efficiency investigation.

For the purpose of this progress report, information available includes winter growth performance and age and weight at puberty.

Replacement heifer calves representative of each breed type were randomly selected at the conclusion of a weaning management study and fed during the wintering period. Rations used the first year were self-fed and consisted of dry rolled barley, chopped mixed hay (crested wheatgrass, bromegrass and alfalfa in approximately equal proportions) salt and dicalcium. Barley made up 30% of the ration at the start and increased to 55% where it was held for the duration of the study. The second year, corn silage was substituted for part of the chopped hay portion, with rolled

barley making up approximately 38% of the ration.

The calves were booster vaccinated three weeks before weaning with a 7-way Clostridium vaccine, and were also vaccinated for brucellosis.

As a preventive measure, the heifers were vaccinated for leptospirosis and vibrosis one month before the start of the breeding season.

The heifers were weighed on 28 day intervals with estrus determined with the aid of sterile epididectomized bulls equipped with Chin-Ball® markers. Weight at first estrus was interpolated based on days between two weigh periods.

Starting June 1st, heifers were randomly assigned to an artificial breeding synchronization study. Following the A.I. breeding, heifers were exposed to fertile cleanup bulls.

Summary

Completion of two years of heifer wintering, and one calving season has shown some very distinct differences between the heifer breed types being compared.

All heifer groups made good gains during the wintering phase, ranging from 2.09 lbs/day for the Angus X Hereford crossbreds to 2.38 lbs/day for the Simmental X Hereford crossbreds. Over the two years, the Milking Shorthorn X (Angus X Hereford) heifers have consumed the most feed per day (28.7 lbs.) and required the most feed per pound of winter gain. (13.1 lb./lb. of gain). These heifers have also had the highest total winter feed cost at $93.47. However, they also exhibited early estrus, with 52.5% cycling in February and 47.5% cycling in March. By contrast, only 8.3% of the Hereford heifers cycled in February, and only 75.3% had exhibited estrus by the end of March.

The Simmental X Hereford heifers were heaviest at first estrus weighing an average of 775 pounds. While based on rather small numbers, 60% of the Simmental X Hereford heifers calved in March and 40% calved in April, even though their apparent first estrus was scattered from February to May one year earlier.

This trial will be continued for several more years to better document winter growth and efficiency overall reproduction performance as these heifers become cows.

Actual calving dates of heifers wintered in 1984 and calving in the spring of 1985.				
	Hereford	Angus X Hereford	M. Shorthorn X (Angus X Hereford)	Simmental X Hereford
Calving in March	4/9 = 44.4%	10/20 = 50%	4/10 = 40%	6/10 = 60%
Calving in April	2/9 = 22.2%	6/20 = 30.3%	5/10 = 50%	4/10 = 40%
Calving in May	2/9 = 22.2%	1/20 = 5.0%	1/10 = 10%	- -
Open	1/9 = 11.2%	3/20 = 15%	- -	- -

Table 1. Gains and Wintering economics of heifers to be used in the cow efficiency study in 1985.				
	Hereford	Angus X Hereford	M. Shorthorn X (Angus X Hereford)	Simmental X Hereford
Gains:				
No. of Head	12	12	12	12
Initial Wt. (1-17-85)	585	635	664	617
Final Wt. (5-7-85)	835	856	895	873
Average Gain	250	221	230	256
Days Fed	110	110	110	110

A.D.G.	2.27	3.01	2.09	2.33
Feed and Economics:				
Total Feed/head, lbs.	3388	3517	3826	3744
Feed/Head daily, lbs. (as fed)	30.8	32.0	34.8	34.0
Feed/lb. gain, lb. (as fed)	13.6	15.9	16.6	14.6
Feed cost/day, $	0.7869	0.8126	0.8754	0.8623
Total feed cost, $	86.56	89.39	96.29	94.85
Cost/Cwt. gain, $	34.66	40.41	41.82	37.04

Table 2. Average Ration consumed by breed comparison heifers fed in 1985.

Breed	Dry Rolled Barley	Corn Silage	Chopped Mixed Hay	Dicalcium Phosphate	T.M. Salt	Total lbs.
Hereford						
As fed	8.32	13.32	8.96	0.10	0.10	30.80
Dry	7.49	4.66	7.44	0.10	0.10	19.79
As fed %	27.01	43.26	29.09	0.32	0.32	100%
Angus X Hereford						
As fed	8.62	13.99	9.16	0.10	0.10	31.97
Dry	7.76	4.90	7.60	0.10	0.10	20.46

As fed %	26.96	43.76	28.64	0.31	0.31	100%
Milking Shorthorn X (Angus X Hereford)						
As fed	9.39	15.29	9.88	0.11	0.11	34.78
Dry	8.45	5.35	8.20	0.11	0.11	22.22
As fed %	27.00	43.96	28.41	0.32	0.32	100%
Simmental X Hereford						
As fed	9.12	14.99	9.70	0.11	0.11	34.03
Dry	8.21	5.25	8.05	0.11	0.11	21.73
As fed %	26.80	44.06	28.50	0.32	0.32	100%

Table 3. Two year (1984 and 1985) average gain and efficiency for heifers to be used in cow efficiency study.

	Hereford	Angus X Hereford	M. Shorthorn X (Angus X Hereford)	Simmental X Hereford
Gains:				
No. of Head	31	32	22	22
Days fed	105.5	105.5	105.5	105.5
Initial Wt.	542	601	625	619
Final Wt.	790	820	859	869

Gain	248	219	234	250
A.D.G.	2.35	2.09	2.22	2.38
Feed and Economics:				
Total feed/head, lbs.	2690	2733	3056	2915
Feed/head daily, lbs.	25.3	25.6	28.7	27.3
Feed/lb. gain, lbs.	10.8	12.4	13.1	11.6
Feed cost/day $	.7852	.7890	.8865	.8407
Total feed cost/head $	82.84	83.35	93.47	88.78
Cost/cwt gain, $	33.50	37.94	40.08	35.40

Table 4. Two year (1984 and 1985) average puberty distribution, age & weight.

	Hereford	Angus X Hereford	M. Shorthorn X (Angus X Hereford)	Simmental X Hereford
Puberty Distribution:				
% showing estrus				
February	8.3	6.7	52.5	22.5
March	67.0	77.5	47.5	40.0
April	5.5	15.8	- -	18.4
May	5.5	- -	- -	5

June	8.3	- -	- -	14.2
Not detected	5.4	- -	- -	- -
Average cycle date	88	78	62	84
Calendar date	March 29	March 19	March 2	March 25
Age at 1st estrus				
Days	358	360	347	368
Months	11.8	11.9	11.4	12.2
Average calculated wt. at 1st estrus	698	729	718	775

Back to 1985 Research Reports Table of Contents
Back to Research Reports
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