

Winter Growth and Breed Production Comparison of First Generation Heifers

By

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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's been conducted in Southwestern North Dakota. This station doesn't have the land base 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 outcrossed 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 were self-fed and consisted of barley, ground mixed hay (crested wheatgrass, brome grass, and alfalfa in approximately equal proportions), salt, and dicalcium phosphate. Barley was started in the ration 30% and increased to 55% where it was held for the duration of the study.

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 vibriosis one month before the start of the breeding season.

The heifers were weighed at 28 day intervals until sterile epididectomized bulls were placed with them. Once the heifers started cycling they were weighed at 14 day intervals and weight at puberty computed.

Starting June 1, the heifers were randomly inseminated with Angus semen for their first calf.

Summary:

Completion of this first wintering period has resulted in some very distinct differences between the heifer breed types being compared.

Simmental X Hereford (SxH) heifers were heaviest (789.6 lbs.) and required the most days of age (383.4) to reach puberty. When reviewing Table 2, you will see that the (SxH) group had the widest onset of puberty distribution. Dates of onset were scattered throughout the months of March, April, May and June, whereas the other breed types were scattered within the months of February, March and April. Those heifers of other breed groups, namely Hereford (H), Angus X Hereford (AxH) and Milking Shorthorn X Angus X Hereford (MSxAxH) that were more tightly grouped had substantially more heat cycles before breeding started on June 1st than did the (SxH) group. Infusion of dairy blood from the Milking Shorthorn breed shortened the average number of days required to reach puberty to 350 days, making them the earliest cycling group. Their weight at puberty was 704.8 pounds. There was no difference in the number of days required for the (H) and (AxH) groups to reach puberty. They required 355 and 354 days respectively. Their weight at puberty was 685.7 pounds for the (AxH)'s and 673.8 pounds for the (H) heifers, a difference of 11.9 pounds.

Daily gains during the wintering period ranged from 2.43 pounds per day among the (SxH) and (H) groups to 2.34 pounds per day among the (MSxAxH) and 2.16 pounds per day among the (AxH) group.

Efficiency of gain as reflected in the wintering cost per hundred pounds of gain varied between groups. Hereford heifers wintered most economically, costing \$32.23/cwt. of gain and were followed closely by the (SxH) group costing \$33.76/cwt. Wintering costs for the (AxH) heifers were \$1.70 higher costing \$35.46/cwt. The Milking Shorthorn cross heifers had the highest wintering costs of \$38.33.

The values reported here will no doubt change as more data is accumulated in future years. Final conclusions should be reserved until the study is completed.

Table 1. First Generation Breeding Scheme

Foundation Cows	X	Sire Breed	Generation I Progeny
Hereford	X	Hereford	Hereford
	X	Angus	Angus X Hereford
	X	Simmental	Simmental X Hereford
Angus X Hereford	X	Milking Shorthorn	Milking Shorthorn X Angus X Hereford

Table 2. Puberty Summary: Distribution of Heat Cycles, Age, Weight and Average Date Puberty Was Reached

	Hereford	Angus X Hereford	M. Shorthorn Angus X Hereford	Simmental X Hereford
Distribution:				
No. Head	9	20	10	10
February	----	5%	30%	20%
March	67%	80%	70%	30%
April	11%	15%	----	20%
May	11%	----	----	10%
June	----	----	----	20%
Not Detected <u>1</u>	11%	----	----	----
Puberty Statistics:				
Average Cycle Date,				
Numerical	90	76.5	63.2	98.7
Calendar	March 30	March 18	March 04	April 08
Age at Puberty,				
Days	355	354	350	383.4
Months	11.8	11.8	11.6	12.8
Average Wt. at Puberty	673.8	704.8	685.7	789.6

1/ Heifers in this category had not been detected by the time artificial breeding was completed.

**Table 3. Gains and Wintering Economics for First Group of Heifers
To be used in the Cow Efficiency Study**

	Hereford	Angus X Hereford	Shorthorn Angus X Hereford	Simmental X Hereford
Gains:				
No. Head	9 <u>1/</u>	20 <u>2/</u>	1	10
Days Fed	101	101	101	101
Initial Wt. lbs.	498	567	586	621
Final Wt. lbs.	744	785	822	866
Gain, lbs.	246	218	236	245
ADG, lbs.	2.43	2.16	2.34	2.43
Feed & Economics:				
Total feed/head, lbs.	1991	1949	2285	2086
Feed/head daily, lbs.	19.71	19.30	22.62	20.66
Feed/lb. gain, lbs.	8.11	8.93	9.66	8.50
Feed cost/day, \$.7834	.7654	.8975	.8190
Total feed cost, \$	79.13	77.31	90.65	82.71
Cost/Cut gain, \$	32.23	35.46	38.33	33.76

1/ One heifer died – heart failure

2/ Replicated lots of 10 head each were used in the Rumensin[®] study. These two lots were used as control lots in that study and served as the Angus X Hereford breed group in this breed comparison.