FEEDLOT BREED COMPARISON OF FIRST GENERATION STEERS

BY

J. L. Nelson and D.G. Landblom

A majority of North Dakota cattle producers are attempting to increase profits in their cattle operation by crossbreeding. The decision on which breeds to combine is not easy and is often made based upon what type and breed combination is selling well at the time. Since the generation interval in cattle is long and the margin between profit and loss is often small, producers may be trapped into producing a "terminal" cross calf before they develop a highly productive brood cow.

Research on beef cow efficiency is just starting to filter out of Research Stations in the U.S. and Canada. The Dickinson Experiment Station has started to evaluate several different crossbred cow types and sizes in order to provide stockmen with data that have been collected under typical western North Dakota conditions. In this breeding study, crossbred brood cow types are being developed that should maximize heterosis when bred back to unrelated terminal sires. The development of these various brood cow types results in the production of steer calves that may have good or poor feedlot or carcass traits.

This phase of the trial compares the feedlot performance and carcass information from steers produced during the first generation of breeding. In 1984, the steers on trial represented four breed types: Hereford; Angus X Hereford; Milking Shorthorn X (A X H); and, Simmental X Hereford. Because of producer interest, three additional pens of steers were included in the 1985-86 trials. These were Charolais X Hereford; Gelbvieh X Hereford; and, Salers X Hereford crossbreds.

All steers were implanted with Compudose^{R}, treated for lice, and vaccinated with a 7-way Clostridium vaccine prior to the start of the feeding period. Average starting weight for all pens was approximately 600 pounds in early December. The steers were bunk line fed a complete mixed ration of dry rolled barley, alfalfa and mixed hay (chopped), corn silage, dicalcium phosphate and trace mineralized salt. The barley portion of the ration started at 30% and was increased by 5% increments until it made up 75% of the total ration. Feed consumption during the trial is summarized in Table 2. The steers were fed on a grade constant basis, meaning that each group was fed until it was felt that 60% of the animals would grade USDA Choice when slaughtered. At this point, the steers were trucked to Held Beef Industries in West Fargo, North Dakota and sold. Dr. Paul Berg, Department of Animal and Range Sciences at NDSU was in charge of slaughter arrangements and collection of all carcass data. Table 1, shows the feedlot gain, economics and carcass data for 1986.

Discussion:

About half of the steers used in this study were purchased locally in order to get uniform starting weights and certain breed types, namely the Gelbvieh crossbreds and the Salers crossbreds. During the early weeks of the trial, several steers exhibited typical "shipping fever" respiratory problems and high fever that required careful observation and early medication. In mid-February, one of the AXH steers died from acute "bloat" and in early April, a Simmental cross steer was removed from trial due to a serious rumen infection. The rest of the steers finished the feeding period with no other health related problems, reaching an estimated 50-60 percent choice in mid June after 190 days on feed. For some reason, the steers in this trial seemed to have a quieter disposition and were easier to handle during routine weighing than those fed in 1985.

Summary:

Steers fed in 1986 gained from 2.63 lbs./day (Gelbvieh cross) to 3.01 lbs./day (Simmental cross) during the 190 day feeding period. Daily feed consumption averaged 28.6 pounds as fed, and ranged from a low of 25.9 lbs. by the Gelbvieh cross to 31.0 lbs. for the Simmental crossbreds. The Charolais cross steers were the most efficient at 9.45 lbs. feed/lb. gain, while the Milking Shorthorn cross steers required 10.9 lbs. of feed per lb. of gain. Feed costs per hundred weight gain varied from $34.57 for the Charolais cross steers to $39.10 for the Milking Shorthorn cross steers. While none of the breed groups returned profitable margins over feed costs, the Charolais cross and the Salers cross steers returned the most while the Milking Shorthorn cross and the Gelbvieh crossbreds returned the least.

Carcass information revealed 55% of the steers graded USDA Choice with Herefords leading with 83%. Loin eye size favored the Simmental X, Gelbvieh X, and Charolais X steers with measurements of over 13 sq. inch, almost two inches larger than AXH, MS (AXH), and Herefords. The Gelbvieh X and the MSX (AXH) had the lightest carcass weights at 619.7 and 645.5 lbs. respectively, while the Salers X steers had the heaviest at 709.2 lbs. Based on $82.00 Choice and $70.00 Good, the actual carcass value varied from a low of $459.19 for the Gelbvieh X to $540.52 for the Simmental X.

Two years combined data in Table 3, show average daily gains ranging from 2.83 lbs. for the Herefords to 3.23 lbs. for the Simmental crossbreds. As might be expected, the Simmental X and the Salers X steers had the heaviest carcass weights. Gelbvieh X steers cut out rib eyes that measured over 13 sq. inches but they lacked some in marbling and thus had the lowest percentage of Choice carcasses. With a rather large spread between Choice and Good prices, this had a very negative effect on their overall carcass value. Average cost per hundred weight gain ranged from a low of $33.17 for the Charolais X to a high of $36.46 for the Herefords.

The three year combined summary for the original four breeds shows ADG ranging from 2.66 lbs./day for the Herefords to 2.93 lbs./day for the Simmental crossbreds. The best overall feed efficiency was shown by the Angus X Hereford cross steers. They also had the lowest cost of gain at $34.53 per hundred weight. All four groups graded about as expected averaging 55% Choice. Carcass value ranged from $548 for the Hereford steers to $595 for the Simmental crossbreds. Overall returns over feed varied from $376 for the Herefords to $404 for the Angus X Hereford crosses.

While this data was gathered from a relatively small sample size, the results do point out some of the strengths and weaknesses of the different breed types. It is important that producers utilize this type of information when they plan their long-range beef production goals.

Table 1. Feedlot Gains, Economics and Carcass Data for 1986

	Angus X Hereford	Gelbvieh X Hereford	Simmental X Hereford	Salers X Hereford	M. Shorthorn X (AXH)	Charolais X Hereford	Hereford
No. of steers	5 1/	6	5 2/	6	6	6	6
Final Weight, lbs.	1130.6	1058.5	1184.4	1201.7	1117.7	1186.5	1136.7
Initial Weight, lbs.	589.0	558.3	613.2	649.7	612.5	621.3	616.5
Average Gain, lbs.	541.6	500.2	571.2	552.0	505.2	565.2	520.2
Days Fed	190	190	190	190	190	190	190
ADG, lbs.	2.85	2.63	3.01	2.90	2.66	2.97	2.74
Hot Carcass Weight, lbs.	665.6	619.7	677.0	709.2	645.5	687.3	650.0
Dressing %	62	59	60	60	59	60	59
Loin Eye Size	11.50	13.13	13.74	12.68	11.50	13.05	11.32
Carcass Yield Grade	2.95	1.62	1.84	2.44	2.63	2.12	2.54
USDA Quality Grade:							
U.S. Choice @ $82.00/cwt	4	2	4	3	4	4	5
U.S. Good @ $70.00/cwt	1	4	1	3	2	2	1
Carcass Value $	530.02	459.19	540.41	538.52	503.57	536.27	533.93

1/ One steer died due to bloat.

2/ One steer removed due to rumen infection.

Least significant difference at 5% = 52.6 lbs.

Table 2. Feed Consumption for 1986

	Angus X Hereford	Gelbvieh X Hereford	Simmental X Hereford	Salers X Hereford	M. Shorthorn X (AXH)	Charolais X Hereford	Hereford
Daily Feed Consumption lbs.:							
Barley	14.61	13.26	15.98	14.62	14.21	14.59	14.56
Corn Silage	7.15	6.46	7.72	7.41	7.65	6.98	7.30
Mixed Hay	5.04	4.52	5.34	4.96	5.22	4.73	4.96
Alfalfa	1.58	1.44	1.72	1.63	1.67	1.61	1.59
TM Salt	0.11	0.10	0.12	0.11	0.11	0.11	0.11
Di Calcium Phos.	0.11	0.10	0.12	0.11	0.11	0.11	0.11
Total lbs./days	28.60	25.88	31.00	28.84	29.12	28.12	28.62
Feed/lb. gain	10.03	9.84	10.31	9.93	10.90	9.45	10.46
Feed Cost/Steer	204.74	185.52	222.33	198.72	197.96	195.37	197.49
Feed Cost/cwt Gain $	37.80	37.09	38.92	36.00	39.19	34.57	37.97
Return Over Feed $	325.28	273.66	318.20	339.79	305.60	340.90	336.43

Feed Prices Used in This Trial:

Alfalfa	$50/ton
Mixed Hay	$45/ton
Corn Silage	$15/ton
Barley	$1.60/bushel
TM Salt	$6.40/cwt
Dical Phosphate	$19/cwt
Grinding & Mixing	$25/ton

Table 3. Two Year Average Feedlot Gains, Economimcs and Carcass Data – Feedlot Comparison Trial

	Angus X Hereford	Gelbvieh X Hereford	Simmental X Hereford	Salers X Hereford	M. Shorthorn X (AXH)	Charolais X Hereford	Hereford
No. of steers	12	13	12	12	13	13	13
Final Weight, lbs.	1109.6	1094.2	1224.2	1172.3	1132.2	1159.8	1103.2
Initial Weight, lbs.	608.5	601.2	660.0	648.9	657.7	625.6	630.4
Average Gain, lbs.	500.8	493.0	564.2	523.4	474.4	534.2	472.8
Days Fed	168	168	176	176	168	175	168
ADG, lbs.	3.00	2.96	3.23	2.99	2.85	3.07	2.83
Hot Carcass Weight, lbs.	653.8	632.7	709.3	695.3	655.3	671.8	637.8
Dressing %	60.5	58.1	59.4	59.8	58.5	59.0	58.75
Loin Eye Size	11.5	13.02	12.5	12.44	11.35	12.6	11.6
Fat Thickness	.52	.28	.36	.34	.41	.32	.52
USDA Choice Grade	9	2	8	7	8	5	7
U.S. Good	3	11	4	6	5	8	6
Actual Carcass Value $	550.50	510.09	597.48	556.01	545.37	534.77	539.52
Return Over Feed $	379.36	342.04	395.57	387.84	372.08	374.86	366.45
Feed/Head/Day, lbs.	29.6	28.94	33.85	30.78	31.22	30.22	28.8
Feed/lb. Gain, lbs.	9.88	9.72	10.50	10.26	10.93	10.02	10.2
Feed Cost/Head, $	171.14	164.42	201.92	181.36	173.29	178.33	173.06
Cost/cwt Gain, $	33.85	33.26	35.74	34.44	36.34	33.17	36.46

Table 4. Three Year Average Feedlot Gains, Economics and Carcass Data
Feedlot Comparison Trial

	Hereford	Angus X Hereford	M. Shorthorn X (AXH)	Simmental X Hereford
Gains:				
No. Head	20	19	20	19
Days Fed	177	170	170	182.3
Final Weight, lbs.	1089.6	1108.2	1138.6	1202.4
Initial Weight, lbs.	619.9	623.6	655.9	670.6
Gain, lbs.	469.7	484.5	482.7	531.8
ADG, lbs.	2.66	2.88	2.86	2.93
Economics:				
Feed/Head, lbs.	25.99	27.4	29.3	30.6
Feed/lb. Gain, lbs.	9.63	9.42	10.2	10.3
Feed Cost/Head, $	171.44	170.08	177.55	201.08
Cost/cwt Gain, $	36.21	34.53	36.57	37.74
Carcass Data:				
USDA – Grade – Choice	9	12	12	10
Good	11	7	8	9
Hot Weight, lbs.	628.6	651.5	653.6	627.5
Carcass Value, $	547.89	578.45	575.90	595.92
Return Over Feed, $	375.78	403.74	394.91	400.22