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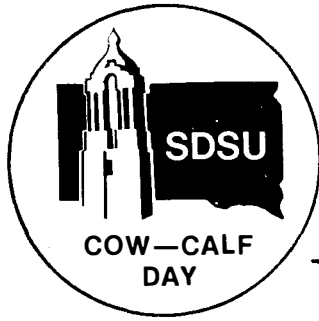
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## EVALUATION OF BREEDS AND BREED CROSSES FOR THE PRODUCTION OF WEANING WEIGHT IN SOUTH DAKOTA

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### Summary

Records on 41,403 calves from 324 contemporary groups were studied to determine the effect of a calf's breed background on its weaning weight. Calves with the heaviest weaning weights were crossbred, typically sired by Continental breed bulls and out of crossbred dams.

### Introduction

Total pounds of weaned calf represent the salable product of the cow-calf operator. The weaning weight of each calf together with fertility of the breeding herd and livability of the calves determine the total pounds weaned. Thus, weaning weight should be considered as a part of the decision-making process.

The objective of this study was to evaluate average weaning weight of different calf breed groups from the records of their performance on South Dakota farms and ranches.

### Experimental Procedure

Weaning weight records for the years 1970 to 1976 were furnished courtesy of the South Dakota Livestock Production Records Association, Inc. Calves born in the same year, on the same ranch and exposed to the same creep feeding management were considered a contemporary group. All sire and dam breed groups were required to have been present in at least three contemporary groups. Those contemporary groups not having crossbred calves and at least two sire or dam breed groups represented by 15 or more calves each were deleted. After imposing these restrictions, 6 straightbred and 73 crossbred calf breed groups remained. The actual calf weaning weights were adjusted to 205 days of age. Averages for each breed group were calculated by a method which is not affected by unequal representation of calves of different sex, from dams of different ages and in differing environmental circumstances.

### Results and Discussion

Table 1 contains the numbers of calves in each breed group, the difference between the overall average and the calf breed group average, a possible

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change value and the calf breed group weaning weight ratio. Possible change reflects the confidence placed in the breed group deviation as a predictor of future samples of the breed group. Both the number of calves and uniformity of weight of calves in each breed group influence the possible change value. Breed groups represented by larger numbers of calves will have smaller possible change values as compared to breed groups with fewer calves.

Results comparing two breed cross calves with their straightbred counterparts indicate a 36-pound advantage for the crossbred calves due to individual heterosis. Maternal heterosis was nearly as important, with calves out of Angus x Hereford and Hereford x Angus cows averaging 32 pounds heavier than calves out of straightbred Angus and Hereford cows.

Maine Anjou sired calves were heaviest at weaning (table 2). Tarentaise, Charolais, Simmental and Chianina sired calves were next heaviest and similar to each other. Simmental x Angus and Simmental x Hereford sired calves were followed by Limousin sired calves. Slightly below average and similar to each other were calves by Gelbvieh, Hereford x Angus, Shorthorn, Angus, Angus x Hereford and Red Angus sired calves. Next were calves by Hereford sires and lightest at weaning were Polled Hereford sired calves.

Simmental x Hereford females weaned the heaviest calves followed in order by Charolais and Charolais x Hereford cows (table 3). Similar to each other and intermediate were calves out of Red Angus, Angus x Hereford, Hereford x Angus and Shorthorn dams, while lightest at weaning were calves out of Angus, Hereford and Polled Hereford dams.

If the ten heaviest sets of calves are compared with the ten lightest, a difference of 162 pounds is observed. Nine of the ten heaviest sets of calves were by Continental breed sires. In contrast, nine of the ten lightest sets of calves were by British breed sires. On the dam side, seven of the heaviest sets of calves were out of crossbred cows, while seven of the lightest sets of calves were out of straightbred cows. Finally, all of the ten heaviest sets of calves were crossbred, but three of the six sets of straightbred calves were among the ten lightest.

Although the information in this summary gives an indication of the relative performance of various calf breed groups for weaning weight, cattlemen should consider several additional factors in deciding on breeds to use. Among those which the authors think important are breed differences in availability, fertility, livability, postweaning growth potential, carcass merit, efficiency and adaptability to local conditions. University personnel will be happy to cooperate with producers in evaluating data for any factors that are important to the decision-making process.

Table 1. Deviation of Calf Breed Group Average Weaning Weight from the Average of All Calves and Associated Possible Change and Ratio

Breed group		No.	Devia- tion	Possible change <sup>a</sup>	Ratio <sup>b</sup>
Sire	Dam				
Angus (A)	Angus	5643	-3	2	99.3
	A x H	804	+15	4	103.5
	Charolais	34	+10	18	102.4
	Hereford	4414	-17	2	96.0
	H x A	324	-36	6	91.5
	Shorthorn	67	-20	13	95.3
A x H	A x H	1175	-12	3	97.2
	Charolais	16	+63	26	114.9
	Hereford	120	-10	9	97.6
Charolais (C)	Angus	761	+31	4	107.3
	A x H	373	+66	5	115.6
	Charolais	747	+70	4	116.6
	C x H	427	+58	5	113.7
	Hereford	619	+28	4	106.6
	H x A	112	+81	10	119.2
	Shorthorn	40	+62	16	114.7
Chianina	Angus	88	+28	11	106.6
	C x H	16	+97	26	122.9
	Hereford	57	+36	14	108.5
	H x A	9	+50	34	111.8
Gelbvieh	Angus	216	-59	5	86.1
	A x H	66	+50	13	111.8
	Charolais	30	+95	19	122.5
	C x H	21	+119	22	128.1
	Hereford	522	-11	5	97.4
	H x A	8	+35	36	108.3
	Red Angus	171	-2	8	99.5
Hereford (H)	Angus	903	+8	4	101.9
	A x H	441	+4	5	101.0
	C x H	33	-43	18	89.8
	Hereford	13788	-31	1	92.7
	H x A	53	+2	14	100.5
	Polled Hereford	22	-113	22	73.3
	Shorthorn	33	+34	18	108.0
	S x H	50	+83	15	119.6
H x A	Angus	18	+21	24	105.0
	Hereford	15	-56	27	86.8
	H x A	511	-5	5	98.8

Table 1 Continued

Breed group		No.	Devia- tion	Possible change <sup>a</sup>	Ratio <sup>b</sup>
Sire	Dam				
Limousin	Angus	305	+29	6	106.9
	A x H	78	+17	12	104.0
	Hereford	583	+4	4	101.0
	H x A	147	+36	9	108.5
	Shorthorn	25	+33	21	107.8
Maine Anjou	Angus	59	+143	13	133.8
	A x H	19	+99	24	123.4
	Hereford	55	+44	14	110.4
	H x A	37	-13	17	96.9
Polled Hereford	Angus	144	-6	9	98.6
	Hereford	86	-15	11	96.5
	Polled Hereford	167	-61	8	85.6
Red Angus	Angus	75	-38	12	91.0
	A x H	38	-29	17	93.1
	Charolais	34	+7	18	101.7
	Hereford	1579	-16	3	96.2
	Red Angus	832	+24	4	105.7
	Shorthorn	16	-8	26	98.1
Shorthorn	Angus	103	+22	10	105.2
	Hereford	219	-9	7	97.9
	H x A	12	-20	30	95.3
	Shorthorn	23	-69	21	83.7
Simmental (S)	Angus	563	+53	4	112.5
	A x H	255	+53	7	112.5
	Charolais	18	+129	24	130.5
	C x H	19	+112	24	126.5
	Hereford	1648	+30	3	107.1
	H x A	232	+70	7	116.6
	Polled Hereford	25	+61	21	114.4
	Red Angus	25	+75	21	117.7
	Shorthorn	16	+70	26	116.6
	S x H	364	+133	6	131.3
S x A	A x H	129	+14	6	103.3
	Hereford	69	+57	12	113.5
S x H	Angus	92	+17	11	104.0
	Hereford	180	-10	6	97.6
	S x H	201	+64	7	115.1

Table 1 Continued

Breed group		No.	Devia- tion	Possible change <sup>a</sup>	Ratio <sup>b</sup>
Sire	Dam				
Tarentaise	Angus	61	+57	13	113.5
	A x H	33	+62	18	114.7
	Hereford	36	+65	17	115.4
	H x A	21	+26	22	106.2

<sup>a</sup> In 99 cases out of 100, the deviation from the average would be expected to change by less than the possible change value when a large number of contemporary groups are considered.

<sup>b</sup> The ratio is the breed group average weaning weight divided by the average weaning weight of all breed groups and then multiplied by 100.

Table 2. Deviation of Sire Breed Group Average Weaning Weight from the Average of All Calves and the Associated Possible Change and Ratio

Sire breed	No.	Devia- tion	Possible change <sup>a</sup>	Ratio <sup>b</sup>	Group <sup>c</sup>
Maine Anjou	170	+94	8	122.2	1
Tarentaise	151	+55	8	113.0	2
Charolais	3079	+52	2	112.2	2
Simmental (S)	3175	+49	2	111.5	2
Chianina	170	+44	8	110.4	2
S x A	198	+34	5	108.0	3
S x H	473	+28	5	106.6	3
Limousin	1138	+16	3	103.7	4
Gelbvieh	1034	-3	3	99.3	5
H x A	544	-5	4	98.8	5
Shorthorn	357	-5	5	98.8	5
Angus (A)	11286	-8	1	98.1	5
A x H	1311	-8	3	98.1	5
Red Angus	2574	-9	2	97.8	5
Hereford (H)	15323	-25	1	94.1	6
Polled Hereford	397	-34	5	91.9	7

<sup>a</sup> In 99 cases out of 100, the deviation from the average would be expected to change by less than the possible change value when a large number of contemporary groups are considered.

<sup>b</sup> The ratio is the breed group average weaning weight divided by the average weaning weight of all breed groups and then multiplied by 100.

<sup>c</sup> Differences in sire breeds and crosses within a group cannot be considered repeatable based on the available information.

Table 3. Deviation of Dam Breed Group Average Weaning Weight from the Average of All Calves and the Associated Possible Change and Ratio

Dam breed	No.	Devia- tion	Possible change <sup>a</sup>	Ratio <sup>b</sup>	Group <sup>c</sup>
Simmental x H	615	+90	4	121.2	1
Charolais (C)	879	+68	3	116.0	2
C x H	516	+58	5	113.7	2
Red Angus	1028	+21	3	104.9	3
A x H	3411	+18	2	104.2	3
H x A	1466	+14	3	103.3	3
Shorthorn	220	+13	7	103.0	3
Angus (A)	9031	+8	1	101.8	4
Hereford (H)	23990	-17	1	95.9	5
Polled Hereford	214	-66	7	84.4	6

<sup>a</sup> In 99 cases out of 100, the deviation from the average would be expected to change by less than the possible change value when a large number of contemporary groups are considered.

<sup>b</sup> The ratio is the breed group average weaning weight divided by the average weaning weight of all breed groups and then multiplied by 100.

<sup>c</sup> Differences in sire breeds and crosses within a group cannot be considered repeatable based on the available information.