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Effect of Breed on Carcass Merit

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Ten years ago most cattle found in feedlots in the Corn Belt and the Northern Great Plains were straightbreds representing one of the British breeds. However, with the increased use of Charolais and the importation of bulls from at least 12 other European breeds into Canada, a large variety of breeds and breed crosses is found in the feedlots at the present time. This increased variety along with emphasis on increased efficiency has caused many feeders to ask questions concerning the performance of these breeds and breed crosses. The purpose of this paper is to review research results in an attempt to identify some breed differences that are of most interest to the cattle feeder.

British Breeds and Charolais

A summary of breed differences relative to beef production that have been observed in crossbreeding experiments was reported at the first Range Beef Cattle Symposium (Dearborn, 1969). The portion of that summary dealing with postweaning growth rate, carcass cutability and carcass grade for the Hereford, Angus, Shorthorn and Charolais breeds is reported in table 1. When interpreting the numerical ratings, 100 should be considered as equivalent to the Hereford breed average. Scores above or below 100 represent a percent deviation (increase or decrease) from the Hereford base (for example, a value of 97 would indicate that this breed averaged three percent less than Herefords in average performance for a particular trait). Actual deviation in relation to Herefords was used for reporting carcass quality grade. The Hereford base for quality grade was set at low choice. The confidence which you may place in each numerical score is related to the number of comparisons, reported in parenthesis, and the consistency of the results. The references for each experiment are identified and reported in the original paper.

These results suggest that Charolais, on the average, exhibit a more rapid postweaning growth rate than do Angus with Herefords and Shorthorns being intermediate. Of the British breeds, Herefords appear to be slightly superior in growth rate. Herefords equaled or exceeded the postweaning growth performance of Angus or Shorthorn in 12 of 13 comparisons. The one exception was a Canadian comparison involving the Milking Shorthorn. Charolais exceeded Herefords for postweaning growth rate in three of four comparisons.

Average breed performance for carcass cutability was similar to postweaning growth rate. Average cutability was highest for Charolais, lowest for Shorthorn with Hereford and Angus being intermediate.

Rankings for carcass quality grade represent an almost complete reversal from the ranking for postweaning gain and carcass cutability. These results suggest that Angus tend to have the highest carcass quality grade followed closely by Shorthorn. Charolais averaged between one-third and one-half quality grade less than did Herefords.

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Crossbred Performance Involving Some Recently Introduced Breeds

Several experiment stations are presently gathering information on the recently introduced European breeds. Additional results are becoming available each year. A recent review (Neuman, 1972) has been used as the basis for table 2. The indexes for each trait allow a relative comparison between breeds. Note that the Simmental average has been used as a reference and therefore is set at 100 for each trait. The indexes represent a percent deviation from this base. The Simmental steer mean from Lacombe is included to further aid in the interpretation.

The data in table 2 indicate that Simmental and Charolais sired calves exhibit comparable postweaning growth rates. Both appear to grow more rapidly than all of the other breeds with Jersey gaining the slowest, Limousin were comparable to the Hereford and Angus and the South Devon intermediate between the Limousin and the Simmental.

Limousin appeared to be slightly more efficient in converting feed to live weight gain than did the Simmental or Charolais. Each of these appeared to be more efficient than the Hereford/Angus average. Jersey were the least efficient in converting feed to live weight gain.

Simmentals have not exhibited dressing percents as high as those observed from Charolais. This difference has been significant (P .05) for the Lacombe experiment. One reason for the lower dressing percent is the heavier hide weight of the Simmental. Limousin appear comparable and maybe slightly superior to the Charolais and British breeds in dressing percent.

Limousin, Charolais and Simmental have all exhibited higher yields of lean cuts than are normally observed with Herefords or Angus. The differences between the Limousin, Charolais and Simmental appear small, although the Limousin and Charolais may be slightly higher in percent edible lean. Simmental have shown a higher percent bone than Charolais in the Lacombe study. Taste panel differences were small, although the trend suggests a need for further study.

Quality grade for the different breeds and breed crosses reported by the U.S.D.A. Meat Animal Research Center are recorded in table 3. These results further confirm the superiority of Angus for carcass quality grade. This is evident in crossbreds as well as in straightbreds. Limousin had the lowest carcass quality grade. Charolais tended to be slightly superior to Simmental.

Additional Breeds Recently Introduced Into Canada

The following breed descriptions are based primarily on a recent literature review (Mason, 1971) which is recommended reading for anyone who is especially interested. Descriptions of breeds introduced into Canada prior to May 1972 are included.

Pie Rouge - The French Simmental breed. Performance is expected to be similar to the Swiss Simmental.

Fleckvieh - The German Simmental breed. Performance is expected to be similar to the Swiss Simmental.

Maine Anjou - Derived from the crossing of the Shorthorn with the local breed (Mancelle) of Maine and Anjou in northwest France. They are large and grow quite rapidly.

Chianina - This is probably the largest and tallest breed in Italy and possibly in all of Europe. A low rate of milk production and a high rate of growth is believed to be characteristic of this breed.

Blond d' Aguitane - A French breed that is sometimes called Garonnaise. It is believed to be similar to the Limousin in yield of edible lean.

Parthenais - A rather large French breed developed for both milk and meat with recent emphasis on milk.

Gelbvieh - Sometimes referred to as "German Yellow." They are considered dual purpose cattle with reasonably high milk production and good growth rate.

Tarantaise - This is a rather small French breed with medium milk production.

Pinzgauer - This is a medium sized Bavarian breed with a distinctive stripe down the back. It displays a moderate rate of milk production.

Additional research information will be forthcoming relative to the breeds included in the previously mentioned comparisons as well as other breeds that are new to the North American continent. Cattle feeders should keep abreast of this research. Some herds perform considerably different than the breed(s) average which they represent. Some of these differences are due to the bulls that have been used. Therefore, in addition to being familiar with average breed performance it is desirable to be familiar with (1) how cattle from an individual herd have performed previously and (2) the performance of the sire(s) of the feeder cattle that are being evaluated.

Literature Cited

Dearborn, D. D. 1969. Breed Differences Relative to Beef Production. The Beef Cow. A Symposium on Production. Printed at the University of Wyoming, Laramie, Wyoming.

Mason, I. L. 1971. Comparative Beef Performance of the Large Cattle Breeds of Western Europe. Anim. Breeding Abstr. 39(1):1-29.

Neuman, J. A. 1972. The New European Beef Breeds and Canada's Beef Industry. Talk presented to the Olds Beef Producer's Course, Olds, Alberta.

Table 1. Average Breed Performance Expressed as a Percent of Hereford Average Performance[a]

	Post-weaning gain	Carcass cutability	Carcass grade[b]
Hereford	100	100	C-
Angus	92.6 (9)[c]	96.6 (7)	+.44 (9)
Shorthorn	98.6 (4)	95.2 (3)	+.30 (3)
Charolais	110.5 (4)	105.0 (3)	-.45 (3)

[a] Taken from D. D. Dearborn, 1969. Breed Differences Relative to Beef Production. The Beef Cow. A Symposium on Production. Printed at the University of Wyoming, Laramie, Wyoming.

[b] Expressed as an average deviation from the Hereford average. Low choice was selected for the Hereford base to be used in this comparison.

[c] The numbers in parenthesis indicate the number of experiments included in each comparison.

Table 2. Relative Performance of Crossbred Calves Sired by Some European Breeds at One or More of Four Cattle Breeding Research Stations[a,b]

Breed of sire	Postweaning avg. daily gain		Postweaning feed ratio		Dressing percent		Percent lean		Taste panel score[c]	
	No. of head	Index	No. of head	Index	No. of head	Index	No. of head	Index	No. of head	Index
Hereford/Angus	91	92	81	105	81	101	81	94	24	100
Jersey	66	94	66	112	66	99	66	94	24	102
Charolais	318	101	318	101	294	102	294	101	53	102
South Devon	31	96	31	103	31	102	31	96	24	100
Limousin	179	93	179	97	133	103	133	102	24	97
Simmental	413	100	179	100	350	100	350	100	49	100
Simmental mean[d]	2.8		7.3		58.4		70.8		5.8	

[a] Adapted from table prepared by Dr. J. A. Neuman, Beef Cattle Geneticist, Lacombe, Alberta, and presented in a presentation delivered at the Olds Beef Producers' Course, Olds, Alberta, January 26, 1972.

[b] The four research stations are Canadian Department of Agriculture Research Stations at Lacombe, Alberta and Brandon, Manitoba, the U.S.D.A. Meat Animal Research Center at Clay Center, Nebraska and the Balcarce Research Station in Argentina.

All calves are out of Angus, Hereford and Shorthorn dams. All performance data are adjusted to a steer calf basis. Data from different stations were combined by:

(i) Expressing breed of sire means as a percent of the Simmental mean for the same station. Simmental crosses were selected as the reference group since they were present at each station.

(ii) Averaging the resulting (percentage) indexes from each station, each weighted according to the number of animals observed at that station.

(iii) The result is expressed as an overall index.

[c] Measured on a scale of 1 to 9 points, higher point rating meaning better eating quality.

[d] Simmental steer performance at Lacombe. Standardized means for the other breed crosses could be computed by multiplying the Simmental mean by the respective indexes.

Table 3. U.S.D.A. Quality Grade - U.S. Meat Animal Research Center Germ Plasm Evaluation Program

Breed of sire	Breed of dam		Sire average
	Hereford	Angus	
Hereford	10.1	10.3	10.2
Angus	10.9	11.2	11.0
Jersey	9.7	10.6	10.2
South Devon	10.4	10.9	10.6
Limousin	9.3	9.5	9.4
Simmental	9.7	10.5	10.1
Charolais	10.3	10.8	10.5
Breed of dam average[a]	10.1	10.6	10.3

[a] 8 = good, 9 = good +, 10 = choice -, 11 = choice, 12 = choice +.