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Weaning Weight Summary for South Dakota Livestock Production Records
Association Member Herds Using Crossbreeding

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The primary objective of this study was to provide members of the Production Records Association an analysis of the weaning weights of various crossbreds produced in member herds. The results should form an important part of the total information needed by members and other cattlemen to formulate individual breeding programs.

Source of Data

Data from the 1970 and 1971 calf crops representing a total of 13,057 straightbred and crossbred calves were used in this study. In 1970, the data were from 39 herds and included 5,352 straightbred and crossbred calves. The 1971 data were from 59 herds and included 7,705 straightbred and crossbred calves. The increased number of herds in 1971 was due partly to an increase in the number of herds enrolled and also in part due to the fact that more producers identified breeding groups within herds. The above numbers represent the calves remaining after the restrictions of at least 15 calves per breeding group per herd per year and at least a total of 40 calves for each breeding group were applied. The restrictions were subjectively chosen prior to the collection of the data.

Method of Analysis

Since environmental differences could be present between herds, within herd deviations were used to compare breeding groups. In order to have a basis of comparison, one breeding group was needed for a standard. Since straightbred Herefords were most numerous, this group was chosen as the standard and results are presented as a ratio of each breeding group to the straightbred Hereford. In each herd the average adjusted weaning weight for each breeding group was calculated and expressed as a percent of the Hereford average adjusted weaning weight. In herds where there were no straightbred Herefords, the ratio to either the Angus or Charolais was calculated. The ratios which were calculated relative to the Angus or Charolais base were converted to a Hereford base by adding the advantage of the conversion group to the ratio. For example, in 1970 the Angus were 5 percent superior to the straightbred Herefords. Therefore, in herds in which the breed groups were compared to Angus, 5 percent was added to the ratio to convert it to a Hereford base. All ratios shown in the tables are in comparison to the straightbred Hereford. For example, line two of table 1 under the 1970 calf crop indicates that 355 head of Angus-Hereford crossbreds were 7 percent superior to the straightbred Hereford.

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Results and Discussion

Although the information in the tables gives an indication of the relative advantage of various crossbreds for weaning weight, cattlemen should consider several other factors in addition to weaning ratio. The relative advantage of various breeding groups could change when factors such as reproductive performance, calving difficulty and calf livability are considered. In addition, the breeding groups which were present in several herds and involved larger numbers of calves will probably be the most reliable estimates of expected performance.

The data are presented in table 1 for 1970, 1971 and the average for both years. Since larger numbers of calves and herds are involved in the average as well as the fact that some of the environmental fluctuations are averaged out, the average figures will be the most useful for evaluation and formulation of breeding plans. However, it should be noted that the performance of the different breed groups were quite consistent for each year.

Results involving straightbred Herefords and Angus and their crosses are similar to results obtained in experiment station work. Using the average of both years, estimates of individual and maternal heterosis in these data are 3.5 percent and 6.5 percent, respectively, for these two breeds. These estimates are within the ranges found in experiment station data. Since none of the other British breed combinations have both straightbred and both kinds of crossbreds present, estimates of heterosis cannot be made at this time.

The results obtained with single crosses involving other British breeds with either Hereford or Angus were very similar to those obtained with Hereford and Angus. The average weaning weight ratio involving single crosses of the British breeds ranged from 103 to 106. Crosses involving the straightbred British sire and crossbred female averaged about 10 percent higher than the straightbred Hereford and about 6 percent higher than two breed crosses.

Straightbred Charolais averaged 23 percent higher than straightbred Herefords when only weaning weight ratio was considered. Two breed crosses with Charolais and either Hereford or Angus were slightly lower than the average of the parent breeds involved. Crosses involving a Charolais sire and crossbred British dams were 7 to 8 percent superior to single crosses involving Charolais sires and straightbred Angus or Hereford dams.

The results of this study suggested that higher weaning weight ratios were obtained when the Simmental and Limousin were crossed on Hereford dams than when crossed on Angus dams. Crosses involving Limousin sires and the crossbred Hereford-Angus dam were intermediate between the crosses of straightbred British sires and Charolais sires on Hereford dams. The crosses involving Galloway and the Hereford dam were similar to the Hereford x Angus cross or 6 percent heavier than straightbred Herefords.

The average weaning weight ratio from the crossbred Angus x Hereford sire on straightbred Hereford dams was 7 percent higher than straightbred Hereford. Although this was slightly higher than single crosses with straightbred parents, it was lower than crosses involving straightbred sires and crossbred dams.

The advantage of the crossbred dam which has been demonstrated in experiment station work is supported by results of this study shown in table 2. With the exception of the crosses involving the Charolais sire in 1970, the crossbred Hereford x Angus dam is superior to the straightbred dam. The fluctuations between the two

years in the weaning weight ratios of the crosses involving Charolais sires and crossbred dams could be due to sampling variation. The average of both years involving Charolais sires indicates an 8 percent advantage for the crossbred dam over the straightbred dam and is consistent with the crosses in the table. These results suggest that crossbred dams produced calves which were an average of 7 percent superior to the average of straightbred Hereford and Angus dams.

Probably one of the most useful functions of this summary is to indicate areas in which cattlemen can cooperate to increase the usefulness of the records that they are collecting. The inclusion of the number of dams of each breed exposed to each breed of bull as well as the numbers of calves born and weaned and also yearling and carcass data will increase the usefulness of this study. Association and University personnel will be happy to cooperate in summarizing the data and making summaries available to cattlemen.

Table 1. Weaning Weight Summary for S.D.L.P.R.A. Herds Using Crossbreeding
1970 and 1971 Calf Crops

| Breed Group | | 1970 | | | 1971 | | | Average | |
|---------------|--------------|----------------------|------------------|-------------------|----------------------|------------------|-------------------|----------------------|------------------|
| Breed of sire | Breed of dam | Weaning weight ratio | Number of calves | Number of ranches | Weaning weight ratio | Number of calves | Number of ranches | Weaning weight ratio | Number of calves |
| Hereford (H) | Hereford | 100 | 1850 | 23 | 100 | 2890 | 40 | 100 | 4740 |
| | Angus | 107 | 355 | 9 | 105 | 173 | 6 | 106 | 528 |
| | H x A | 108 | 101 | 2 | 110 | 87 | 4 | 109 | 188 |
| Angus (A) | Angus | 105 | 332 | 4 | 101 | 1720 | 19 | 103 | 2052 |
| | Hereford | 104 | 533 | 12 | 104 | 1045 | 25 | 104 | 1578 |
| | H x A | 108 | 216 | 4 | 111 | 97 | 3 | 110 | 313 |
| Red Angus (R) | Hereford | 102 | 199 | 3 | 104 | 115 | 2 | 103 | 314 |
| | R x H | 112 | 44 | 1 | -- | -- | -- | 112 | 44 |
| Shorthorn (S) | Angus | 104 | 46 | 2 | 102 | 42 | 2 | 103 | 88 |
| | Hereford | -- | -- | -- | 106 | 62 | 2 | 106 | 62 |
| Charolais (C) | Charolais | 123 | 118 | 3 | 122 | 172 | 4 | 123 | 290 |
| | Angus | 116 | 469 | 8 | 106 | 390 | 8 | 111 | 859 |
| | Hereford | 110 | 430 | 4 | 109 | 260 | 9 | 109 | 690 |
| | H x A | 107 | 355 | 9 | 128 | 86 | 4 | 118 | 441 |
| | R x H | 117 | 83 | 1 | -- | -- | -- | 117 | 83 |
| Simmental | Angus | 104 | 46 | 2 | -- | -- | -- | 109 | 46 |
| | Hereford | -- | -- | -- | 112 | 120 | 5 | 112 | 120 |
| Limousin | Hereford | 105 | 175 | 3 | 107 | 90 | 2 | 106 | 265 |
| | Angus | -- | -- | -- | 101 | 78 | 4 | 101 | 78 |
| | H x A | -- | -- | -- | 114 | 82 | 1 | 114 | 82 |
| Galloway | Hereford | -- | -- | -- | 106 | 111 | 4 | 106 | 111 |
| A x H | Hereford | -- | -- | -- | 107 | 85 | 1 | 107 | 85 |

Table 2. Comparison of Weaning Weights of Straightbred and Crossbred Dams

| Breed of sire | | Breed of Dam | | Straightbred Mean | Hereford x Angus |
|---------------|------|--------------|-------|-------------------|------------------|
| | | Hereford | Angus | | |
| Hereford | 1970 | 100 | 107 | 105.5 | 108 |
| | 1971 | 100 | 105 | 102.5 | 110 |
| Angus | 1970 | 104 | 105 | 104.5 | 108 |
| | 1971 | 104 | 101 | 103.0 | 111 |
| Charolais | 1970 | 110 | 116 | 112.0 | 107 |
| | 1971 | 109 | 106 | 107.5 | 128 |
| Limousin | 1971 | 107 | 101 | 104.0 | 114 |
| Average | | | | 105.3 | 112.3 |