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# A Survey Evaluation of South Dakota Beef Cattle Production

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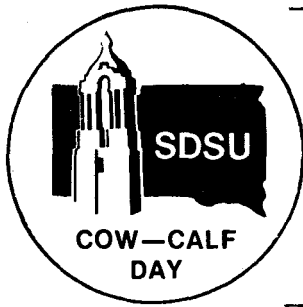
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## **A Survey Evaluation of South Dakota Beef Cattle Production**

**Vern Dooley**

**Dept. of Animal Science Report**

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Profit in a cow-calf operation depends largely on pounds of calf weaned. This in turn is dependent upon calf crop percentage and weaning weight of calves. Producers need to recognize losses associated with low fertility and light weaning weights and be aware of some of the factors contributing to these losses. This study was designed to aid producers by providing information on the level of commercial beef production in South Dakota. We have further sought to identify some factors influencing that level of production.

This report summarizes information supplied through a sequence of producer completed surveys. Thus, it was through the conscientious efforts of many producers that we were able to succeed.

### Procedure

The survey mailing list was compiled by randomly selecting names from the South Dakota Beef Cattle Improvement Association membership, six breed registry association memberships and a list of recipients of a state breed magazine. Six questionnaires were mailed from May, 1978, to January, 1980. Information requested on each mailing pertained to management activities common to the particular season. Each operation was assigned an identification number so that all data from that operation could be included in the record of one herd and the individual producers remain anonymous.

The sample was expanded in 1979 by randomly selecting additional names from the South Dakota Beef Cattle Improvement Association membership and the list of persons receiving a state breed magazine. Three questionnaires were mailed to these people from May, 1979, to January, 1980. Questionnaires were similar to those utilized for the original survey. Information obtained from this 1-year study was incorporated with that from the 2-year study.

Data from any producer failing to complete all three questionnaires pertaining to one production year were excluded from analysis. Questionnaires pertaining to 1978 calves were returned by 216 producers; questionnaires pertaining to 1979 calves were returned by 281 producers.

Fertility was evaluated in this study by examining calving rates. Number of females exposed for breeding was corrected by subtracting number of pregnant females sold between breeding and calving and adding number of pregnant females purchased in the same period. This provided the number of exposed females maintained through calving. Calving rate was the number calving expressed as a

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percentage of exposed females maintained in the herd. Factors studied in connection with calving rate included grazing conditions, heifer condition, cow condition, herd type, area of state, year, breeding season length and herd size.

Grazing conditions, heifer condition and cow condition were subjective scores provided by producers using scales of excellent, good, fair or poor. Grazing condition scores provided information on the adequacy of pastures throughout the breeding and lactation periods. Female condition scores indicated the average condition of animals in the herd when breeding began.

Each respondent reported the type of herd maintained: seedstock, straightbred commercial, crossbred commercial, seedstock and straightbred commercial, seedstock and crossbred commercial, straightbred and crossbred commercial or seedstock, straightbred commercial and crossbred commercial. Different operation types have different objectives, and different objectives often dictate different management practices. Because production levels may be affected by differences in management that could not be completely enumerated in this study, herd type was considered as a source of variation.

Beef operations of the same type may employ different managerial practices across South Dakota. Producers in western counties traditionally make use of native grass rangeland for much of their feed supply. Producers in eastern counties tend to utilize improved pastures and more intensive management to compliment farming operations. These differences were considered by dividing the state into three areas (figure 1) and including area of state as a source of variation in calving rates. Herds were assigned an area designation based on the county in which respondents resided. Cropland area was composed of 26 eastern counties containing at least twice as much land devoted to crop production as that devoted to pasture or rangeland. Mixed area consisted of 18 central counties containing moderate mixtures of crops, pastures and native grass ranges. Rangeland area was composed of the remaining 23 counties located in western South Dakota and containing at least twice as much land in pasture or range as in crops.

Year was considered since production levels may differ between years for a variety of reasons that may or may not relate to management.

Breeding season length was measured in days and considered as another source contributing to differences in calving rate.

Herd size was the final source considered. This was a continuous variable corresponding to number of exposed females maintained in the herd.

The second trait evaluated in this study was weaning rate. This was computed for each herd by expressing number of calves weaned as a percentage of number of exposed females. Factors considered as sources of variation included percent assisted and mean calving date in addition to those considered for calving rate.

The number of females each producer reported assisting at calving was expressed as a percentage of number calving to obtain percent assisted.

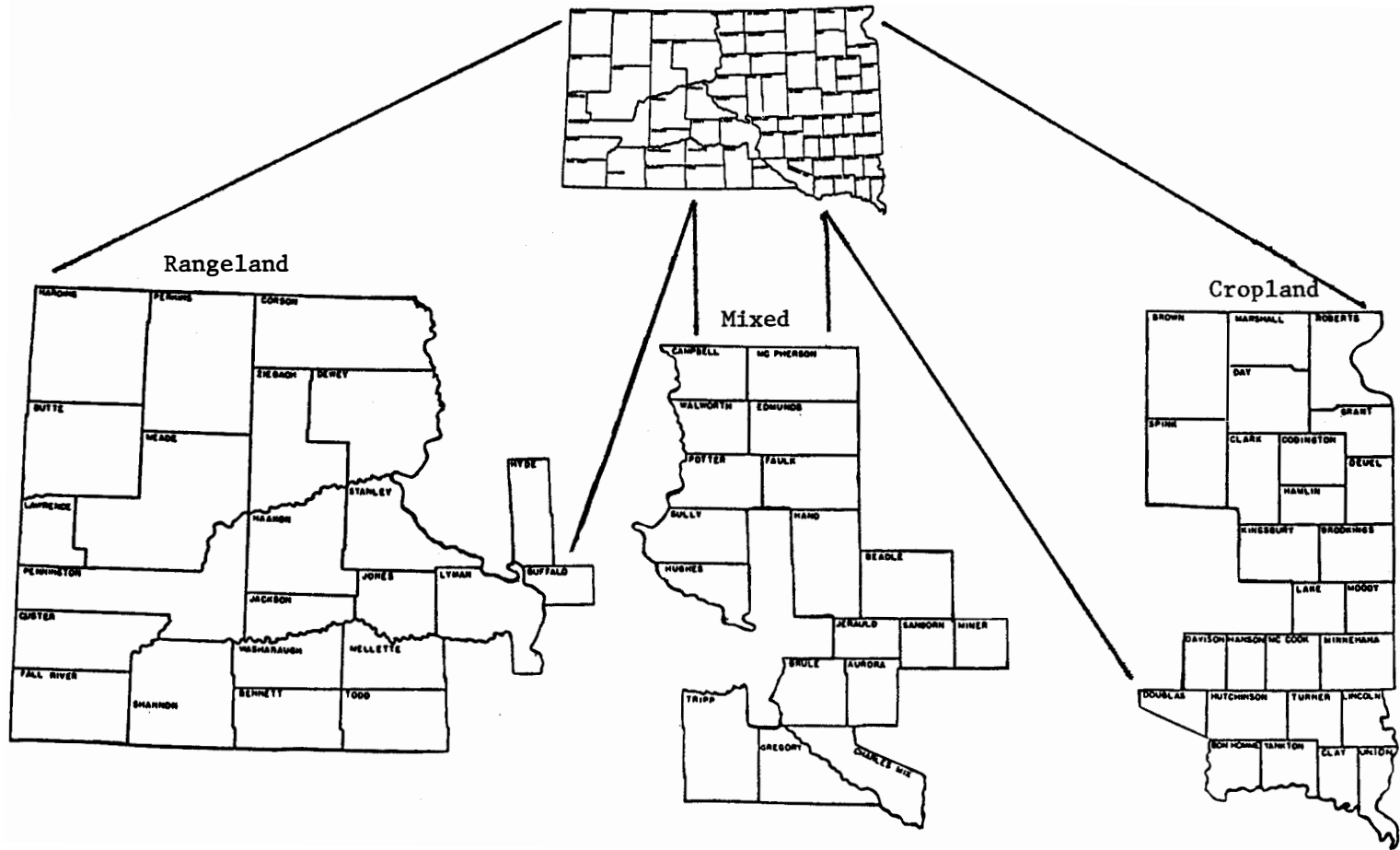


Figure 1. Division of South Dakota into three areas of study.

Birth dates of the first and last calf were averaged to find an unweighted mean calving date for each herd. Calving date and percent assisted were considered because of their expected effect on calf survival.

The final trait evaluated in this study was the mean weaning weight computed for each cooperating herd. Factors considered as sources of weaning weight variation were grazing condition, heifer condition, cow condition, creep feeding, sex of calf, herd type, area of state, year, herd size, mean calving date and age of calf.

A description of herds included in this survey can be found in table 1.

TABLE 1. MEANS OF SEVERAL TRAITS DESCRIBING PARTICIPATING HERDS

Variable	Area of state			Statewide
	Rangeland	Mixed	Cropland	
Herd size (head)	193	159	131	163
Breeding season length (days)	84	101	104	95
Mean calving date (day of year)	112	119	122	117
Assistance level (%)	7	9	7	8
Calving rate (%)	88	87	86	87
Weaning rate (%)	77	79	78	78
Weaning age (days)	211	208	208	209

### Results

The analysis revealed cow condition to be a significant source of variation in calving and weaning rates. Table 2 shows the largest difference exists between cow herds in fair condition and those in good condition. Herds ranked as fair probably contain many cows in less than optimum condition for breeding. Cows in poorer body condition often require longer postpartum periods before showing estrus and exhibit lower conception rates at first service. These factors could lower calving rates by preventing conception within a desired breeding season. Research has also shown greater calf mortality when cows are in poorer body condition. This may have contributed to the 7.9% weaning rate difference between herds in good condition and those in poor condition.

Calving and weaning rates differed with herd types as shown in table 3. These differences are difficult to fully explain since we cannot adequately characterize herd types as to management. Crossbred commercial operations appeared to enjoy the greatest calving and weaning rates. Many of these herds probably contain crossbred females which have been shown to excel in reproductive rates. Also, crossbred calves have been shown to exceed straightbred calves in preweaning livability. These factors may have contributed to observed reproductive rate differences between herd types. However, management differences may also be important.

TABLE 2. LEAST SQUARES MEANS OF REPRODUCTIVE RATES FOR COW CONDITIONS

Cow condition score	Percent calving	Percent weaned
Excellent	87.6	77.5
Good	86.4	77.9
Fair	83.3	69.9

TABLE 3. LEAST SQUARES MEANS OF REPRODUCTIVE RATES FOR HERD TYPES

Herd type	Percent calving	Percent weaned
1. Seedstock	84.2	71.9
2. Straightbred commercial	87.2	76.2
3. Crossbred commercial	88.3	77.8
4. 1 and 2 combination	84.3	74.2
5. 1 and 3 combination	84.6	72.9
6. 2 and 3 combination	85.5	75.1
7. 1, 2 and 3 combination	86.3	77.6

Weaning rate was found to significantly differ with mean calving date. To examine the relationship, calving dates were divided into month classifications as shown in table 4. With the exception of February, differences between months did not exceed 2%. Herds calving very early may receive closer observation at calving and therefore experience less death loss. Research has shown most calf losses occur within a week of birth. Herds calving after May reported weaning rates less than 73.5%. Since the dam's effect on calf survival is primarily through the nutrition she provides, it is important she receive proper nutrition to support adequate lactation. Herds grazing pastures which decline in quality in mid-summer may experience greater mortality in late calves.

Creep feeding, herd type and area of state significantly affected calf weaning weights. Twenty-two percent of the cooperating producers provided creep feed for suckling calves, resulting in calves 22.3 pounds heavier than noncreep fed calves (table 5).

TABLE 4. LEAST SQUARES MEANS OF WEANING RATES FOR MEAN CALVING MONTH

Calving month	Weaning rate
February	78.4
March	74.2
April	74.9
May	74.0
June	73.0
July or later	73.3

TABLE 5. LEAST SQUARES MEAN WEANING WEIGHTS FOR CALVES WITH AND WITHOUT CREEP FEEDING

Creep provided	Weaning weight
Yes	481.4
No	459.1

The effect of herd type on weaning weight can be seen in table 6. Herds involved in seedstock production reported 23 pound heavier weaning weights than those in commercial calf production. Seedstock operations probably manage calves differently than commercial herds, although we cannot sort out all these differences. Many seedstock producers leave males intact, contributing to heavier weights since bull calves exhibit greater potential for preweaning gains than do steer calves. Also, creep feed is provided to more than 26% of the herds involved in seedstock production compared to less than 20% of those strictly involved in commercial calf production. A portion of the 42-pound difference observed between crossbred and straightbred commercial herds may be attributed to the greater genetic potential generally reported for crossbred calves.

Rangeland area and cropland area weaning weight means are very similar (table 7). The survey data did not reveal important management differences to explain the lighter weights in the mixed area. Further study is needed to determine the factors responsible for this variation.

TABLE 6. LEAST SQUARES MEAN WEANING WEIGHTS FOR HERD TYPE

Herd type	Weaning weight
1. Seedstock	490.4
2. Straightbred commercial	447.9
3. Crossbred commercial	490.3
4. 1 and 2 combination	493.8
5. 1 and 3 combination	494.1
6. 2 and 3 combination	465.1
7. 1, 2 and 3 combination	484.4

TABLE 7. LEAST SQUARES MEAN WEANING WEIGHTS FOR AREA OF THE STATE

Area of state	Weaning weight
Rangeland	489.2
Mixed	469.6
Cropland	483.8

We have not attempted to examine all environmental factors affecting reproductive rates or weaning weights. This study has, however, pointed out some important sources of variation and perhaps some opportunities for individual producers to increase their production.

The mean calving and weaning rates show very little variation across the state. There appears to be a 13% loss of potential calf crop due to failure to conceive or early embryonic death and an additional 9% loss between calving and weaning. This represents a substantial loss of income to cow-calf producers. Certainly, there is much variation between individual herds. However, South Dakota's beef industry as a whole needs to consider the reasons 22 of every 100 females do not raise a calf.

Providing creep feed to suckling calves appeared to increase weaning weights. This practice involves extra costs and producers will need to weigh these costs against the additional pounds of calf that may be weaned. Since calves substitute creep for grass and milk where these sources are limiting calf growth, creep feeding should be given special consideration if grass is in short supply. The state average 78% weaning rate and 469-pound weaning weight are certainly respectable when compared to estimates from other areas of the country, but they also indicate we have more work to do before reaching full potential.