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Profits and Losses in Ranching, Western South Dakota, 1931-1940

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G. E. Korzan

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Profits and Losses in
RANCHING,
Western South Dakota,
1931-1940



Agricultural Economics Department
AGRICULTURAL EXPERIMENT STATION
South Dakota State College
Brookings, S. D.

A Brief Summary

Many ranchers have succeeded quite well in western South Dakota while others have failed. This study was made in an attempt to find out how the successful operators have made money; that is, how their ranches are organized and how the operators manage their business so as to make it successful.

From a study of the climate, land, water supply and grass it appears that an individual can be successful with either cattle or sheep, whichever he likes to work with best, and some few operators who are located in sections where the soil is fertile might find it profitable to farm some land to produce feed and in some cases cash crops. It is important to remember, however, that crop and feed production in this area is uncertain due to the great variation in the amount of precipitation which falls, and furthermore, that while some of the winters are mild and open so cattle can be grazed nearly all winter others are cold and occasionally snow lies on the ground for over three months.

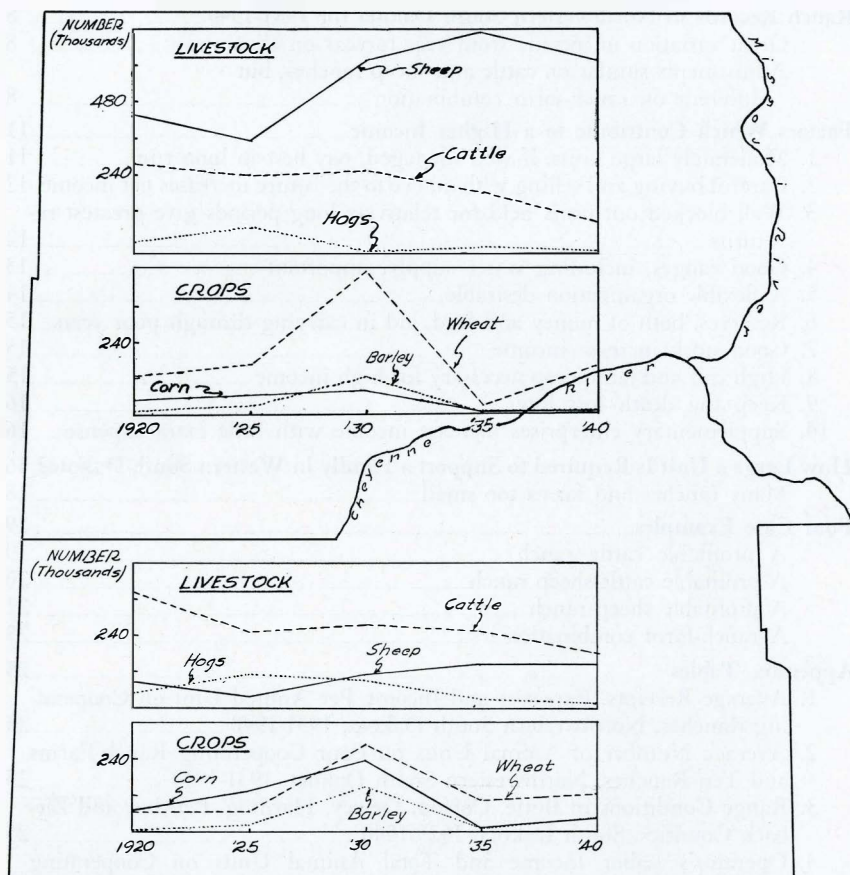
Operators who have been successful in this area over a period of years have built reserves in good years to assist in carrying through the poor periods. Some have made a practice of stacking up roughage and accumulating other feed, others have managed to accumulate financial reserves and some have accumulated reserves of both feed and cash. Records of ranchers kept in cooperation with the South Dakota Agricultural Experiment Station over the past decade provide convincing evidence that only those who have reserves when years such as 1934 and 1936 come are able to continue to operate and live without accepting public relief. Even operators who had feed reserves were forced to liquidate a large proportion of their livestock in 1936 and only those with financial reserves were able to purchase stock again and take advantage of the good range conditions and prices of recent years. Some operators moved stock out of the area for feed in 1936 but this did not prove too satisfactory due to the large expense, high death loss and low calf or lamb crop the following spring.

Other factors are also important to obtain a higher income. (a) Moderately large units, if well managed, will pay best in the long run. (b) Careful buying and selling with an eye to the future is the policy of successful operators. (c) If not over-grazed well-blocked out units held for a relatively long period of time give the greatest returns. (d) Good ranges, including the water supply, are important to facilitate the rapid growth and development of livestock. Several recommended practices for improvement and use of the range are given in this bulletin. (e) A flexible organization aids in carrying through poor periods. Some supplementary enterprises give flexibility and increase income with little extra expense. (f) Good stock, high calf or lamb crop, and low death loss all aid in increasing income.

This and other studies indicate that from 90 to 100 cows and appurtenant young stock, or the equivalent in sheep, and from 3,400 to 6,500 acres are necessary to support an average family where there are few or no supplementary enterprises. Where other profitable enterprises can be combined with ranching fewer livestock and smaller acreage will be required. These conclusions are based on the assumption that the operator has average managerial ability and that the relative price, cost, and yield relationships of the past will not change materially. As these factors or the size of the family varies, the size of unit required will also vary. Many operating units in the area are too small to provide a desirable level of living for the family. Earlier studies also indicated that the size of unit was too small.

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Source: U.S. Census.

Fig. 1. Livestock Numbers and Harvested Acres of Principle Grain Crops in Western South Dakota by Census Years, 1920-1940.

Profits and Losses in Ranching, Western South Dakota, 1931-1940

AARON G. NELSON AND GERALD E. KORZAN¹

SINCE THE COMING of the trail herds to western South Dakota some 65 years ago, many ranchers have prospered but not without numerous and varied difficulties. Climatic conditions have fluctuated considerably with the result that feed has been plentiful some years while in others large numbers of livestock have died from lack of adequate winter feed. In periods of high precipitation farming has offered stiff competition in the more level fertile sections. Economic conditions have stimulated prosperity at times and caused distress at others.

Ranch organization and management in western South Dakota is analyzed in this bulletin. During the period 1931-40 operators in the northwestern part of the state kept records of their business in cooperation with the South Dakota Agricultural Experiment Station and these have been studied in an attempt to obtain information concerning the types of enterprises which are adapted to the area and how they can be combined and managed to give the greatest income. Information from other ranch studies which substantiate or supplement the findings of this study is included.

The conclusions of this study apply explicitly to northwestern South Dakota but are generally applicable to all the western part of the state.

Both Cattle and Sheep Adapted to Area; Selected Sections Can Be Cultivated

Considerable numbers of both sheep and cattle have been in the area for the past 20 years (See Fig. 1.) Cattle numbers declined some, especially during the past decade, while sheep increased, particularly in the northern part. Quite a few hogs were in the area during the 1920's but the drouth of the past decade

reduced the number until relatively few remained.

Considering long periods of time, cash-crop production alone has not been successful in the larger part of western South Dakota. However, the growth of some feed crops is necessary for the best development of the livestock industry

1. Aaron G. Nelson is Assistant Economist and Gerald E. Korzan, Research Assistant in Farm Management, South Dakota Agricultural Experiment Station. The authors wish to express their appreciation to the ranchers in western South Dakota who cooperated in keeping records and to those who supervised and/or worked on the project, including C. M. Hampson, Ralph Henderson, H. P. Hanson, Wallace McMartin and Max Myers. The authors also gratefully

where native grasses are not adequate for winter feed and in some sections crops might be produced to provide supplementary income. During the 1920's the cultivated acreage in western South Dakota increased, wheat production expanding most. Drouth, grasshoppers, etc., practically eliminated crop production in many parts of the area in the early and middle 1930's. During the last two or three years, the area cultivated has come back slightly in some sections.

Climate Favors Grazing, But Not Without Risk. Many winters are relatively open and mild, making winter grazing possible; but cold, hard winters occur, both singly and in succession, and feed reserves should be built in preparation for such periods. About one-third of the winter's snow² is on the ground a month or less (See Table 1). Usually it remains for one and one-half to two months and frequently for two and one-half months, but some years snow is on the ground over three months. Furthermore, the coldest weather usually occurs when snow is on the ground, the temperature dropping as low as -30° to -40°F. for several days in succession at times, which adds considerably to the severity of the winter. A combination of heavy snow and cold weather is very difficult to overcome unless adequate preparations have been made.

acknowledge the information, criticisms and suggestions given by members of the Experiment Station and Extension staffs of State College, T. S. Thorfinnson and Olav Rogeness of the Bureau of Agricultural Economics, U. S. Department of Agriculture.

Rough copies of most of the figures were made and some supplementary data summarized by the Works Projects Administration through Official Project No. 165-1-74-158.

2. Two or more inches.

Table 1. Number of winters with varying periods of snow cover, Miles City, Montana, 1893-1941

Days with 2 or more inches of snow	Number of Winters	Cumulative Percentage
0 - 15	7	14
16 - 30	9	33
31 - 45	9	52
46 - 60	11	75
61 - 75	9	94
76 - 100	3	100
	48	100

The average annual precipitation although light, averaging only around 14 inches, is adequate to produce good feed where soil conditions are favorable. However, extreme fluctuations occur from year to year and from period to period. This is illustrated in Fig. 2 which shows the yearly precipitation at Camp Crook, South Dakota, 1893-1940. Fluctuations of 6 to 10 inches from one year to the next are common and average precipitation for 4 or 5 year periods fluctuates nearly as much. These fluctuations, while inherent in the climate, are the source of much grief for ranchers, encouraging overstocking and even breaking of sod in wet periods, and forcing the sale of livestock for want of winter or summer feed, or both, and the abandoning of cultivated land in dry periods.

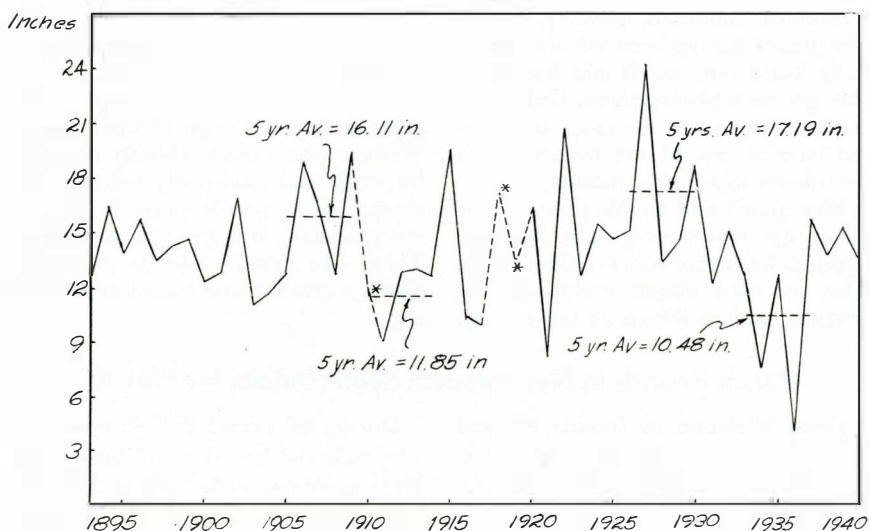
Topography, Soil, and Water Supply Generally Permit Wide Range of Uses.³

The larger part of the area is level to gently rolling, however, some sections are rough and broken. The more level

3. For a more detailed discussion, see:

Wilson, M. L. and others, A Study of Ranch Organization and Methods of Range-Cattle Production in the Northern Great Plains Region, U. S. Department of Agriculture Tech. Bul. 45, 1928.

Johnson M. B. Cattle Ranch Organization and Management in Western South Dakota, S. Dak. Agr. Exp. Sta. Bul. 255, 1930.



Source: U. S. Weather Bureau.

*Data not Available at Camp Crook; 1910 taken from Bison Weather Station, 1918 and 1919 from Strool.

Fig. 2. Crop Year Precipitation (September 1 of previous year to August 31 of designated year) at Camp Crook, South Dakota, 1893-1940.

sections make cultivation possible where other factors permit; the rough and broken sections are frequently an asset to ranchers, facilitating winter grazing by aiding in preserving grass and affording natural protection for livestock against the weather.

The soils are fertile in most sections although extremely wide variation exists in soil types. The texture of the soils ranges from sands to fine clays, with the heavy loams predominating. Generally, the flat uplands and the river and creek valleys are more fertile than the rolling upland soils. The light colored and sandy soils grow vegetation only under more favorable climatic conditions, and the bad-lands sections are unproductive regardless of moisture.

The water supply is generally ample for livestock, however, in some parts it is not well distributed over the range and has been supplemented by wells or

reservoirs, the building of the latter having been greatly stimulated in recent years by government conservation and range programs. Practices for improving the range water supply are discussed in the section, "Factors Which Contribute to a Higher Income."

Native Vegetation Palatable, High in Nutritive Value.⁴ The area is "... well suited to the production of a good quality, grass-fat beef, because of the fattening qualities of the native grasses and the further possibility of producing a quality of beef that carries a firm finish."⁵ Some sections of the range are in

4. For a more detailed discussion see: Ibid. U. S. D. A. Tech. Bul. 45 and S. Dak. Bul. 255.

Material that deals with determining the character and condition of range vegetation in South Dakota is limited and further surveys of range areas are needed to give an accurate basis for plans and practices for range improvement.

5. Ibid. U. S. D. A. Tech. Bul. 45 p. 11.

a rundown condition, however, the native grasses having been wholly or partially killed out, weeds and less palatable grasses replacing them. Utilization and maintenance of the range is discussed later as one of the factors which contributes to a higher income.

Blue grama and buffalo grass are the most important short grasses. Both are highly palatable for either cattle or sheep. They are used almost exclusively for grazing, seldom becoming tall enough

for hay. Both grasses cure well on the range, a very valuable characteristic, facilitating fall and winter grazing.

Western wheat and green needle grass are the most important tall grasses. Western wheat grass is highly palatable for cattle and moderately palatable for sheep; green needle grass is slightly less palatable for both cattle and sheep. These two grasses provide practically all the native hay and considerable grazing.

Ranch Records in Northwestern South Dakota for 1931-40⁶

Great Variation in Income Showed From Year to Year on All Units. Average income was \$241.⁷ (See Fig. 3). Receipts fluctuated more than expenses, some of which remained relatively constant. The income for the years 1931-34 was relatively low as a result of low prices, or poor range conditions, or both. Prices, while low all four years, were lower in 1933 and 1934. Range conditions were not very good in 1931 and were worse in 1934; the other two years were relatively good.

In 1935 the range was fairly good and prices were about average.⁸ Both prices and range conditions were very poor in 1936—the worst year on record in the area.⁹ Expenses were unusually high largely due to added feed and labor costs.

During the period 1937-40 operators, who were not forced out of business in 1936, made out well. Early in 1937 the ranges were not very good, but came back fast since livestock numbers were low and climatic conditions favorable. Prices were good these years and livestock numbers gradually were being rebuilt.

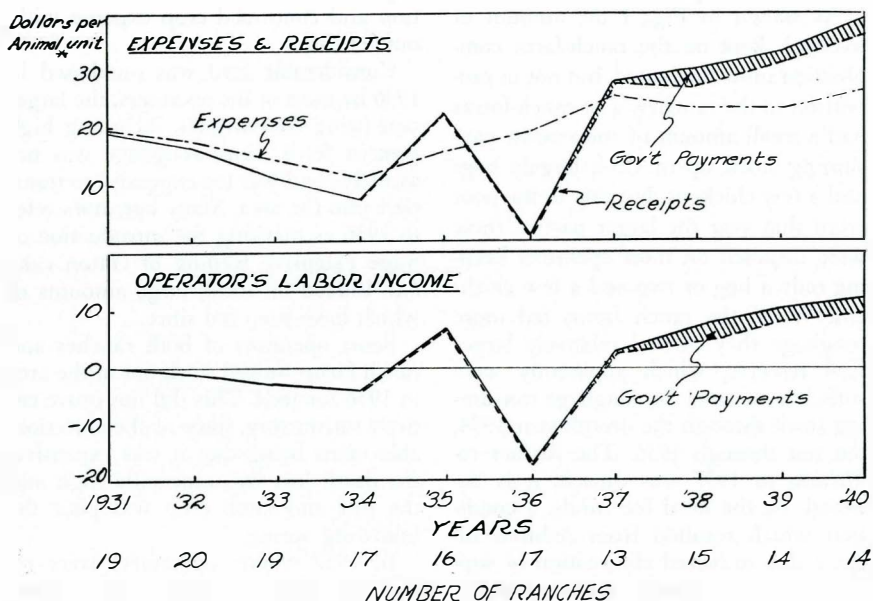
Adjustments Similar on Cattle and Sheep Ranches, but Different on Ranch-Farm Combination. Livestock numbers, as shown in Fig. 4, fluctuated greatly on both sheep and cattle ranches. The numbers were reduced some in 1934 and drastically in 1936, nearly all stock being sold in some cases. The reduction in both years was caused largely by poor range conditions (See Fig. 5). It should be noted that just prior to 1934 livestock numbers had been increasing, probably partly due to the low prices, and the reduction in 1934 merely off-set some of this increase. The possible overstocking in 1932 and 1933 may have contributed to the poor condition of the range in 1934.

6. On nearly all ranches the year included from November 1 of the preceding year to November 1 of the designated year.

7. Operator's labor income, i. e., the returns to the farm operator for his labor in addition to a house, meat, garden, and dairy products furnished by the ranch.

8. The price of stocker and feeder cattle at Miller, S. Dak., for the period 1911-39 averaged \$6.83 per hundred weight; the price in 1935 was \$6.65. Source: Myrick, Delbert C., Manuscript on Agricultural Prices in Hand County, South Dakota, 1882-1940. (Being prepared.)

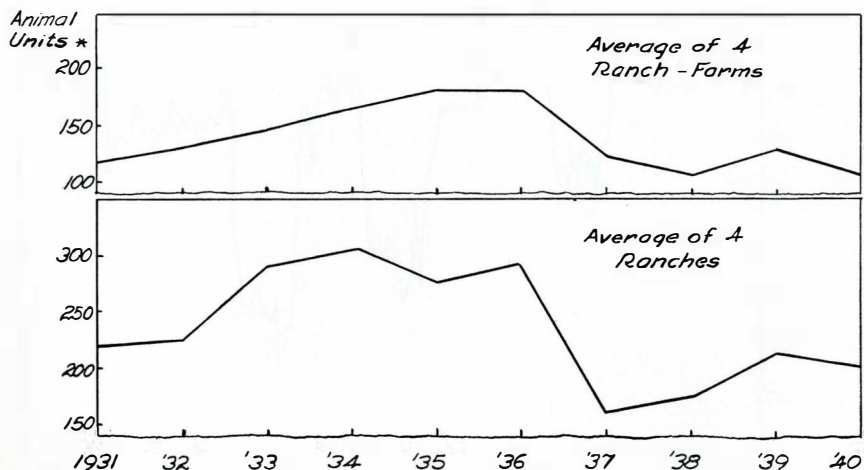
9. Prices on central markets were higher in 1936 than in 1934 but this was not true in this area, probably due largely to the poor condition of the stock.



Source: Appendix table 1.

Fig. 3. Average Expenses, Receipts, and Operator's Labor Income per Animal Unit* for Cooperating Ranches in Northwestern South Dakota, 1931-1940.

*For definition see footnote 20, p. 15.



Source: Appendix table 2.

Fig. 4. Average Number of Animal Units* on 4 Cooperative Ranches—Farms and 10 Ranches, Northwestern South Dakota, 1931-1940.

*For definition see footnote 20, p. 15.

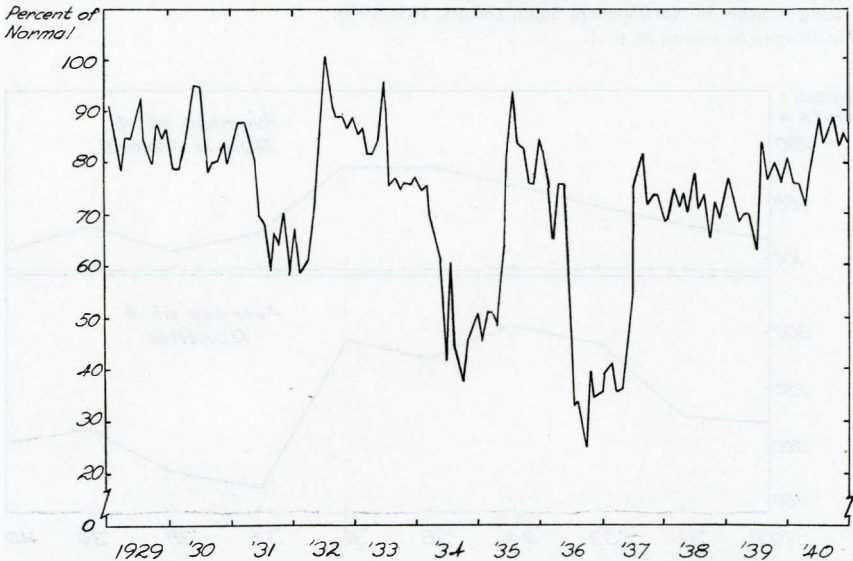
As shown in Fig. 4 the amount of livestock kept on the ranch-farm combination units fluctuated, but not in proportion to the ranches. The ranch-farms had a small amount of concentrate consuming stock up to 1934, largely hogs and a few chickens, but due to the poor crops that year the larger part of these were disposed of, most operators keeping only a hog or two and a few chickens. While the ranch farms fed more roughage they carried relatively larger feed reserves, which apparently were sufficient to carry the roughage consuming stock through the drouth year 1934, but not through 1936. The further reduction in 1937 was caused, it is believed, by the need for funds, a condition which resulted from reduced income due to forced elimination of supplementary enterprises (hogs and chickens, for example) from the organiza-

tion and continued crop expense without returns.

Considerable feed was purchased in 1936 by most of the operators, the larger part being concentrates, including high protein feeds, since roughage was not available and was too expensive to transport into the area. Many operators refer to 1936 as marking the introduction of more extensive feeding of cotton cake and linseed oil meal, large amounts of which have been fed since.

Some operators of both ranches and ranch-farms moved stock out of the area in 1936 for feed. This did not prove entirely satisfactory, some of the objectionable items being that it was expensive, the death loss was unusually high and the calf and lamb crop was poor the following spring.

In 1937 when operators were rebuilding their livestock organization following the ruinous year of 1936 sev-



Source: Appendix table 3.

Fig. 5. Range Conditions in Butte, Corson, Dewey, Harding, Perkins, and Ziebach Counties, South Dakota, 1929-1940.

eral purchased sheep who previously had only cattle. Usually income from sheep is obtained a little sooner than from cattle.

The number of horses kept is noteworthy. They were reduced some in

1934 and 1936 but not in proportion to other livestock. A number of operators probably have more horses than they need and income likely would be increased if these were replaced with either cattle or sheep.

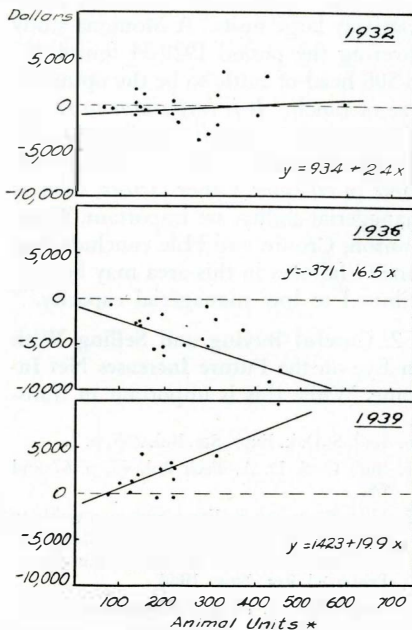
Factors Which Contribute to a Higher Income

1. Moderately Large Units, if Well Managed, Pay Best in Long Run. The year 1935 was about average considering price and range conditions. A number of the larger operators having from 200 to 250 head of cattle, or the equivalent in sheep or other stock, made more money than the smaller ones but this was not universally true. Some of the larger operators actually made less (or lost more) largely due to having a poor calf crop and high death loss.

In good years higher returns were obtained from the larger units. This relationship is shown for 1939 by the scatter diagram in Fig. 6. The years 1938 and 1940 show a similar correlation. Both prices and range conditions were fairly good these years.

In poor years large units seem to fare worse than smaller units. The year 1936, when both prices and range conditions were very poor, appears to substantiate this (See Fig. 6). During the years 1931 to 1933, when the range was fairly good but prices were low, small ranches made about as much on the average as the large ones—there was no correlation between size and income. This is due to a relatively large proportion of ranch costs being fixed or varying inversely with income; that is, they cannot be reduced and sometimes they increase when prices or range conditions are poor, and they do not increase materially with good range and price conditions. Taxes, interest, rent and labor come largely in this class. Taxes require

a relatively long time to adjust to conditions; interest rates change but have a tendency to lag considerably. In poor years the amount of interest paid has a tendency to increase because operators have to borrow more. In some cases rental rates changed a little according to conditions but, as a whole, the total amount paid remained relatively constant be-



Source: Appendix table 4.

*For definition see footnote 20, p. 15.

Fig. 6. Scatter Diagram Showing Relationship of Operators' Labor Income to Size of Ranch (Indicated by Animal Units),* Northwestern South Dakota. A large ranch is not always an asset.

cause whenever possible operators hold their leased land in an effort to maintain their unit. Some lease more, if possible, when range is poor. Labor expense usually increases in periods when range conditions are poor, since more feeding is necessary.

Other studies also indicate that moderately large units are more profitable. M. B. Johnson came to this conclusion in his study of ranching in this area in the late 1920's.¹⁰ M. L. Wilson and others found this to be true in their study of ranching in the area in 1924.¹¹ The Bureau of Agricultural Economics, recently studying agriculture in parts of Perkins, Ziebach and Meade counties of South Dakota found that the more successful individuals were operating relatively large units.¹² A Montana study covering the period 1929-34 found 400 to 500 head of cattle to be the optimum size of ranch.¹³ *It is important to recognize, however, that increasing the size of operating unit will not increase income in all cases.* Other factors, such as managerial ability, are important. Thorfinnson, Cronin and Hile conclude that "many failures in this area may be contributed to low managerial capacity."¹⁴

2. Careful Buying and Selling With an Eye on the Future Increases Net Income. While this is important in trans-

actions such as buying feed, renting land and hiring labor, in most cases it probably is of greatest importance in the purchase and sale of livestock. Operators have lost "small fortunes" by inopportune purchase of stock. One rancher lost from \$4,000 to \$6,000 in the late 1920's by purchasing cattle just before the fall in prices. Others have lost money by unwise sales. By watching the market and careful culling of herds in periods of high prices a somewhat higher aggregate income can be obtained. This is true of both cattle and sheep. Walker and others studying sheep ranching in New Mexico found that the upper income group of ranchers received a little higher price on the average for sheep marketed.¹⁵

3. Well Blocked Out Units Held for Relatively Long Periods Give Greatest Returns.

Operators using non-adjacent tracts of land are at a disadvantage, and this unfavorable position is intensified when such tracts can be held for but very short periods. The range on these units usually is below average and in some cases the rental rate is above average.

Due largely to the original settlement and land use system in western South Dakota the present land tenure and use pattern is not conducive to efficient ranch and ranch-farm operation. Some efforts are being made by Federal and local governments to acquire and combine scattered private holdings. Where such units lie adjacent to national forests or other public lands, consideration might be given to acquiring such land and blocking out units so as to facilitate proper use.

10. Ibid. S. Dak. Expr. Sta. Bul. 255, p. 2.

11. Ibid. U. S. D. A. Tech Bul. 45, p. 67 and 68.

12. Hile, Raymond B. Farm Size as a guide to Planning in the Tri-County Soil Conservation District. U. S. D. A., Bur. of Agr. Econ. Processed Rpt. Nov. 1940.

13. Sanderson, H. M. and Chittenden, D. W. Cattle Ranching in Montana. Mont. Agr. Expr. Sta. Bul. 341, 1937, p. 24.

14. Thorfinnson, T. S., and others. Size of Farm in Relation to Family Requirements in the Northern Great Plains, U. S. D. A., Bur. of Agr. Econ. Mimeographed Rpt. (No Date).

15. Walker, A. L. and others. Economics of Sheep Production in Western New Mexico, New Mexico Agr. Expr. Sta. Bul. 204, 1932, p. 4.

4. Good Ranges, Including Water Supply Are Important to Facilitate Rapid Growth and Development of Live-stock. Where ranges are good the stock will not only be heavier but will carry a better finish, thereby commanding a higher price. The calf crop will be higher and the death loss probably lower, both important factors to ranch income. These will be discussed further under under points 9 and 10.

A good stand of palatable grass is one of the first prerequisites to a good range.

Several Practices for Range Improvement Are Recommended.

★ Permitting the range plants to reseed naturally is perhaps the simplest and most natural of the recommended practices. "Given any overgrazed range, no matter how badly it has been abused, and either keep the stock off it for a term of years, or reduce the number to the point where the grass will not be eaten off each growing season and seeding season, and nature will take care of the rest, and, excepting in rare cases, the old grasses and forage crops will return."¹⁶

★ Artificial seeding as a means of restoring and improving ranges is stressed in a report on the western ranges made by the U. S. Department of Agriculture. Crested wheat grass, western wheat grass, and green needle grass are considered most suitable for range seeding purposes. Considerable work remains to be done in developing reseeding practices. Barnes, in discussing methods of reseeding, favored late fall sowing with some working of the soil to offer the seed the best possible chance to germinate and secure a start.

A summary of experiments with native and introduced grasses at the U. S.

Dryland Field Station at Ardmore, South Dakota, states that if satisfactory stands of crested wheat grass and western wheat grass can be maintained over a period of years, it would appear from the results obtained thus far that these two grasses offer more profitable pasturage than the native grasses. However, the cost of preparing the ground, the cost of the seed, and duration of the stand must be taken into account.

These studies, as well as practical experience of operators, indicated that seeding of introduced grasses has its place, and under certain conditions can be successful. However, further work along these lines is needed.

For Optimum Utilization and Maintenance of the Range the Following Practices Are Recommended:

★ The carrying capacity should be given careful consideration and care be taken not to over-stock the range. Since the carrying capacity may change from season to season attention should continually be focused on this problem to prevent overgrazing.

★ The distribution of salting grounds and, where possible, watering places so that there will result fairly even feeding on all parts of the range.¹⁷

★ The careful application of rotation, deferred, and controlled grazing systems, where such practices are applicable. Rotation grazing usually involves the division of the range into several portions, one of which is left idle each year to reseed and rest, while the others are used for grazing. Deferred grazing is similar to this except the idle portion of range is left for a period and is then grazed. Controlled grazing involves the continuous use of range by a carefully

16. Barnes, Will, *Western Grazing Grounds and Forest Rangers*, p. 235-6.

17. Compare: Asland, H. B., and Rockford, L. H., *Cattle Management for Improving the Range*, Colo. Agr. Ext. Bul. 319A, 1932.

calculated number of livestock so as to permit at least a portion of the grass to mature and a good vegetative cover to remain.

The advantages of these systems tend to be confirmed by grazing studies. Experiments with grazing steers at the Ardmore, South Dakota Dryland Experiment Station indicates that a system of limited grazing gave higher gains per head than heavy stocking of similar native pastures. Moreover, where rotation grazing was practiced the greatest gains were secured.

Chapline, Inspector of Grazing, U. S. Forest Service says: "Deferred grazing, or deferred and rotation grazing, which provides for reserving the grazing from part of all areas of range land until after seed maturity, although now widely applied, deserves extensive use throughout the West."¹⁸

As is recognized in the report "The Western Range," deferred and rotation grazing practices cannot profitably be applied to all ranges. "Continual moderate grazing (controlled) is more suitable on (1) ranges used year-long, such as these of the Southwest; (2) on many ranges where it is not now desirable to construct the fences and structures required to control the movement of the stock; (3) for those important forage species that are not dependent on seed for reproduction; and (4) locally in Arizona, the Northern Great Plains, and California where certain areas are used during the winter and others during the summer."¹⁹

★ Control of range soil erosion. This problem has long been recognized by serious students of range management.

Perhaps the most effective methods of erosion control is the maintenance of adequate vegetative cover, which may involve any or all of the practices of controlled and regulated grazing, reseeding and fire prevention, supplemented by methods such as contour furrowing of hillslopes, construction of various types of dams in gullies, planting of grasses, brush, or trees.

★ Improve the range water supply. This probably can be done by (a) repair and improvement of present supplies by deepening of reservoirs, construction of tanks and fencing stock away from the reservoir proper; (b) providing new sources of water supplies through construction of overflow dams on streams or by blocking out of land as far as possible to facilitate use of existing supplies.

★ Where "Alkali disease" is found seleniferous soils areas should be located and grazed only lightly if at all. The State Agricultural Experiment Station has done considerable work on this subject and operators having trouble are invited to contact the Station for advice.

5. A Flexible Organization Desirable. Greater income over a period of time can be obtained if the ranch organization is capable of expansion in periods of high prices and good range conditions, and contraction when price and range conditions are poor. Great losses can be avoided, where the organization is flexible. Flexibility can be attained to a degree by saving cows and young stock in good periods and culling when conditions are poor. Where some farming is combined with ranching, concentrate consuming livestock can be added to increase flexibility.

Not only should the organization be flexible but the business should be arranged in such a way that the expense

18. Chapline, N. R., Soil Erosion a National Menace. U. S. D. A. Cir. 33, p. 33.

19. U. S. D. A. The Western Range. 74th Congress, 2nd Session. Document No. 199. 1936, p. 503-4.

items as rent and interest or principal payments vary according to income. To the extent that taxes could be varied the financial strain would be relieved. Tax collections vary under the present arrangement mostly by taxes going delinquent in poor periods. Society probably would be better off if tax levies were varied to aid operators in coming through drought and depression periods in a better producing condition.

6. Reserves, Both of Money and Feed, Aid in Carrying Through Poor Years.

Operators who had such reserves survived the poor years of the past decade much better than those who had no reserves. Financial reserves made possible the purchase of feed when that was short and the purchase of stock following years such as 1936. Ranch No. 1, discussed later, illustrates this point. Feed reserves enable operators to carry stock through drouth periods.

Good years occur which provide operators an opportunity to build reserves. The late 1920's were profitable, as have been the late 1930's, while some poor years have intervened. The average income for 1938-40 was \$9.68 per animal unit,²⁰ while in 1932 it was a negative \$1.34 and in 1936 it was still lower being a negative \$18.45. Individual cases indicate that where the family was frugal in the better years they also had sufficient to live on in the poor years. Moreover, the operators who built feed reserves in good years were not forced to liquidate their livestock in poor periods as were those who had no feed on hand.

20. Calculation of animal units—one cow with or without calf at side under six months was considered a unit, one bull 1.25 units, 1 two-year-old beef animal .80 of a unit, 1 one-year-old beef animal .60 of a unit, one horse 1.25 units, 5 sheep a unit, 8 hogs a unit, 25 turkeys a unit, and 100 chickens a unit.

7. Good Stock Increases Income.

Statistical data on this point are not available from 1931-40 records but it is known that the young stock grow out better, are of higher quality and bring higher prices if the breeding animals are of good quality, and the expenses of operation are approximately the same in both cases. Usually the most economical and practical method of improving stock is to obtain good sires or rams and gradually increase the quality through breeding rather than by outright purchase of the breeding stock. This is also the conclusion of an earlier study in this area made by the U. S. Department of Agriculture. "The use of good bulls is a practical means of herd improvement, and results are usually obtained in the first calf crop from them."²¹

8. High Calf and Lamb Crop Necessary for High Income. A study of individual cases indicates that operators with the higher incomes per animal unit have the highest calf or lamb crop. The average calf crop for all ranches for the 10-year period was 65 percent when long yearling heifers were included with cows.²² This probably is a little below the long time average for these operators due to the extremely low calf crop in 1936 and 1937, the result of the drought.

Other studies also indicate that a high calf or lamb crop increases income. In a study of around 100 cattle ranches from 1929 to 1934 in Montana it was found that "The calf crop was a very significant factor in the income of most of the ranches. The individual ranches falling within the range of 60 percent

21. Ibid. U. S. D. A. Tech. Bul. 45, p. 43.

22. Not all yearling heifers were bred but the records do not give the number which was. When yearlings are excluded the calf crop was 78 percent.

to 85 percent calf crop did not show any higher operating costs at 85 percent or higher than did those obtaining the lower percentages. In other words, the higher the percentage of the calf crop and resulting higher incomes were secured by superior management rather than by higher costs.²³

A study in New Mexico showed that the ranches in the highest income group had a lamb crop 9.9 percent greater than the lowest income group.²⁴ Good calf and lamb crops are obtained by keeping the stock in good condition, especially at breeding time. Some successful operators keep reserve pastures for the breeding season. The fact that good calf and lamb crops follow good years is convincing evidence of the result of keeping stock in good condition. The 1937 ranch records show a 45 percent calf crop, the result of poor range conditions, and 1939, an example of a good range year, a calf crop of 82 percent.

It is also necessary to have sufficient bulls or bucks and to keep them in good condition. Some follow the practice of holding back part of the bulls or bucks to replace those which become run down as the breeding season advances.

9. Keep the Death Loss Low. Obviously any such loss effects income. Some loss probably is unavoidable due to factors such as accident, disease, poisonous plants, or feed shortage but by careful and intelligent management such factors can be eliminated to a large degree

and losses can be held to a minimum without incurring much if any additional cost.

The average death loss on cattle ranches studied from 1931 to 1940 was 4.2 percent, which probably is high largely due to an extremely high death loss (about 8 percent) in 1936 and 1937 as a result of the 1936 drouth. When these years are excluded the death loss was 3.5 percent.

Data on death loss in sheep are not available except for one ranch which is discussed later as one of the four case examples.

10. Supplementary Enterprises Increase Income With Little Extra Expense. Such enterprises use labor and equipment which probably would go unused otherwise. All operators probably would increase their standard of living and perhaps their cash income if they had a garden (and on most all ranches a suitable spot can be located), milked a cow or two and kept a few chickens. Crops, such as alfalfa seed, may bring supplementary income on some ranches. This was particularly true prior to the 1936 drouth. Where some farming is carried on in connection with ranch operations stock such as hogs might be kept in periods when grain crops are good. Such livestock could be sold in dry years. This system is illustrated in ranch No. 3, discussed later. Turkeys might be produced on some ranches; these would require less grain than hogs.

How Large a Unit Is Required to Support a Family in Western South Dakota?

Under average conditions and where there is little or no income from supplementary enterprises from 90 to 100 cows,

and appurtenant young stock, or the equivalent in sheep, seem necessary to support a family, assuming this will require from \$500 to \$600 in addition to products produced on the ranch that are

23. Ibid. Mont. Bul. 341, p. 20.

24. Ibid. N. Mex. Bul. 204, p. 4.

used in the home. Under these conditions around 4800 acres will be required on the average, only around 3400 being required in the better sections, but 6,500 in the moderately poor areas.²⁵

Other studies indicate that as much or more stock would be required under similar conditions. Saunderson and Chittenden, studying ranching in Montana for the period 1929-34, conclude that "The ranch which runs less than 100 head of cattle through the year will find it difficult to make efficient use of labor and equipment. A herd of 125 to 150 head, not including calves born during the year, appears to be desirable for the family which uses little or no hired labor, when there is no other income-producing enterprise."²⁶

In a study of ranching in the contiguous parts of the Dakotas, Montana, and Wyoming in the late 1920's the following statement was made: "It would seem, however, that without other enterprises it would be necessary to carry at least 150 breeding cows to provide sufficient income to pay expenses, to pay a reasonable wage to the operator, and make a return on his investment. This would mean that in this region the minimum size of ranch where very few cash crops are grown should have from five to seven sections of land if all of it is to be under control."²⁷

Where other profitable enterprises can be combined with ranching fewer livestock and acres will be required. For example, if one-third of the family needs

could be provided by income from such things as crops, dairy products, hogs, or poultry the number of cows or ewes and young stock could be reduced by about one-third, and the acreage could be reduced somewhat also, depending upon the nature of the supplementary enterprises. A study made in the Hyde county area in the central part of the state shows that where around 15 percent of the income is obtained from supplementary enterprises, 80 cows, or their equivalent in ewes, and around four sections of land will support a family.²⁸

In selected areas where farming can be profitably carried on the acreage can be reduced to one or one and a half sections of land. This is indicated by a study made in parts of Ziebach, Meade and Perkins counties.²⁹ However, this was found to be possible only where around 30 to 40 percent of the land can be cultivated and an intensive livestock organization is maintained to give the major part of the income. A detailed study of a 960 acre farm in this area showed that 287 acres were cultivated, that wheat was the major crop, that 11 cows were milked and that some income was obtained from poultry and hogs.³⁰

The above conclusions are based on the assumption that the relative price, cost and yield relationships of the past will not change materially. Obviously, if the price of beef cattle is relatively higher in the future a smaller number will be required to give the same amount

25. This conclusion is based primarily upon ranch records for the year 1935 which appears to be about average considering price and range conditions, and upon a survey of range carrying capacity made by the Animal Husbandry Department, S. Dak. Agr. Exp. Sta., 1940.

26. *Ibid.* Mont. Bul. 341, p. 24.

27. *Ibid.* U. S. D. A. Tech. Bul. 45, p. 68.

28. Nelson, Aaron G., Planning Minimum Sized Ranches and Farms for the Hyde County Area in South Dakota. S. Dak. Agr. Expr. Sta. Bul. 346, 1940.

29. Hile, Raymond B., Farm Size as a guide to Planning in the Tri-County Soil Conservation District, U. S. D. A. Bur. of Agr. Econ. Process Rpt., November, 1940.

30. Thorfinnson, T. S., Through Depression on a Plains Farm, Land Policy Review, January, 1941, U. S. D. A.

Table 2. Number of Farms and Cultivated Acreage by Size Groups, Western South Dakota, 1940.

Item	Under 500 acres	500 - 999 acres	1000 acres & over				
	No. of Farms	Harvested acres per farm	No. of Farms	Harvested acres per farm	No. of Farms	Harvested acres per farm	Total No. of farms
Northwestern South Dakota							
Total	2734	50	1313	108	2222	157	6269
Percent of Total Farms	44		21		35		100
Southwestern South Dakota							
Total	3187	36	1327	90	2113	200	6627
Percent of Total Farms	48		20		32		100

Source: U. S. Census.

of money for family living, and vice versa. For example, the income per cow (animal unit) for the period 1938-40 was roughly 40 percent greater than in 1935, largely due to higher prices, range conditions being about the same. If these relatively high prices should prevail the records indicate that the breeding stock, and acreage, could be reduced by about 30 percent. However, if the relatively low prices of the early 1930's should prevail, ranches of all sizes would be unprofitable unless costs could be materially reduced or operations be made more efficient.

Many Ranches and Farms Too Small.

This conclusion seems to be justified in view of the large number of small units which exist in western South Dakota, as reported by the 1940 census. As is shown in Table 2, nearly half the operating units in western South Dakota are under 500 acres and another one-fifth is between 500 and 1000 acres. All these units have a relatively small acreage of cultivated land which makes even the larger units inadequate to support an average family. The census does not classify units above 1000 acres but probably some of these also are too small. Small ranches and farms also have but few livestock.

The size of the unit required will vary some according to the size and composition of the family and the amount required for such items as retirement of debts and savings. In the above conclusions it was assumed that the family needs would be about average, and that a relatively small amount would be available for debt payment or savings. Where a larger amount is needed for a family living or large payments or savings are required, a larger unit will be necessary, or the unit will have to be more efficiently operated. On the other hand, quite a number of units probably can be smaller. As Thorfinnson points out: "It is evident that a number of the families studied have been able to subsist on units below what has generally been considered the minimum-size requirements for this area because the number of persons in the family was considerably below average. Obviously, bachelors, or families of two people having no children can be expected to make a living on smaller tracts of land than families having 4, 5, 6 or more persons in the family."³¹

31. Thorfinnson, T. S., and others. Size of Farm in relation to family Requirements in the Northern Great Plains, U. S. D. A. Bur. or Agr. Econ. Mimeographed Rpt. (No Date)

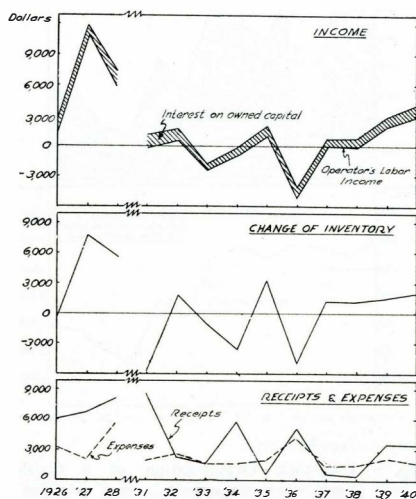
Four Case Examples in Northwestern South Dakota

An Example of a Profitable Cattle Ranch. For the period 1926-28,³² this ranch paid out very well (See Fig. 7). However, from 1931 to 1940 the income was much lower, but the operator was able to carry through this period because he saved in the late 1920's. The average annual operator's labor income for the 13 years that records are available was \$1,153, but was a negative \$288 on the average for the period 1931-40. However, the interest on owned capital was relatively large throughout the period making more funds available for savings or family living.

Costs such as rent, taxes and interest were relatively constant, the average annual amount spent being \$590 (See appendix Table 5). The other expenses varied much more. For example, in 1927, no feed was purchased while in 1936, it was necessary to spend \$1,735 for feed.

The total number of acres operated increased considerably from 1926 to 1940 (See Fig. 8). For the years 1926-28, slightly less than 5,000 acres were operated. By 1936 the acreage had been increased to more than 7,000 acres and by 1940 to 8,000 acres. During the earlier years, considerable land was cultivated, but from 1936 to 1940 farming became less important (See appendix Table 5). The average number of acres cultivated each year was 132.

The number of cattle fluctuated considerably over the period. Even though prices were low relatively large numbers of cattle were sold in 1931, 1934 and 1936, due to the poor range conditions.



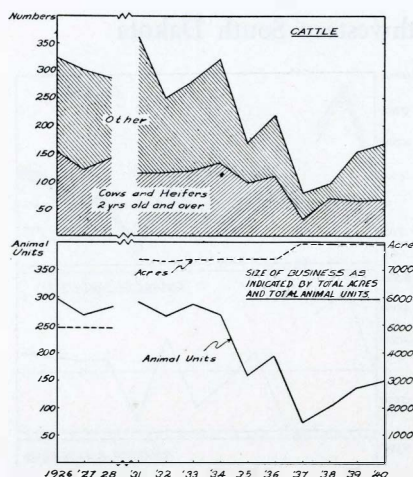
Source: Appendix table 5.

Fig. 7. Financial Summary of a Cattle Ranch, Northwestern South Dakota, 1926-1940. (Years 1929 and 1930 not available.)

At the beginning of 1926, there were 323 head of cattle on this ranch. The number declined to 286 in 1928, but was up to 360 in 1931. However, before the year 1931 was over, a large number of cattle were sold leaving only 250 in 1932. The number again increased to 280 in 1933 but decreased to 170 by 1935. At the beginning of 1936, the number was up to 222 but decreased sharply to 79 in 1937. After 1937 the number of cattle increased gradually until in 1940 there were 169 head.

This ranch had the highest calf crop of any studied for the period 1931-40, averaging 90 percent. For the years 1926-28 the calf crop was nearly 70 percent. The death loss was only 2.8 percent which was considerably below average. The high calf crop and low death loss probably contributed materially to this operator's above average income.

32. Taken from records collected prior to the present study by South Dakota Agricultural Experiment Station and Bureau of Agricultural Economics, cooperating, for S. Dak. Agr. Exp. Bul. 255.



Source: Appendix table 5.

Fig. 8. Livestock Organization of a Cattle Ranch, Northwestern South Dakota, 1926-1940. (Years 1929 and 1930 not available.)

The operator is emphasizing proper stocking of the range to facilitate such things as rapid growth and finish of stock, and to be better able to carry through drouth years. Despite the relatively large acreage in 1940, the ranch did not carry nearly as many cattle as it did in 1926. The ranch probably was overstocked prior to 1937, because in dry years it was necessary to sell a large number of cattle. Since 1937, however, the ranch has been understocked and an effort is being made to increase the cattle numbers so that the range might be fully utilized.

The cattle on this ranch are of excellent quality because it has been the practice to use good bulls. As a result, the records showed that cattle sold from this ranch command relatively high prices.

An Example of a Profitable Cattle-Sheep Ranch. This ranch was selected as an example because it seems to illustrate

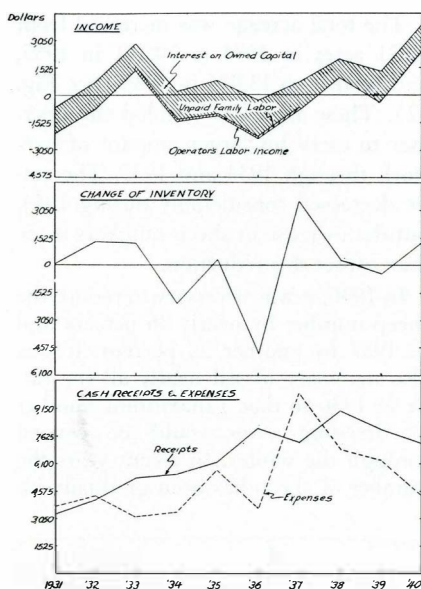
what can be done on a relatively small ordinary ranch if the operator and his family study the outlook situation and plan their business, work hard, and save in good years to assist in carrying through the poor. The operator's average annual labor income for the period 1931-40 for this rancher was \$802, which was considerably above the average of \$241 for all the cooperating ranches. As is shown in Fig. 9, he lost money in 1933, 1934 and 1936, but made fairly well in 1935 and following 1936.

The total cash receipts varied considerably from year to year, the extreme being a low of \$1,232 in 1933 and a high of \$11,767 in 1940, a range of \$10,535. In 1934 and 1936 the receipts were relatively high because of the forced liquidation of breeding stock due to drouth.

There was considerably less variation in the total cash expenses over the period, and the variability would have been still less if the operator hadn't found it necessary to buy additional livestock and land, and to make repairs when he could afford them.³³ The large purchases of feed in 1934 and 1936 also increased the variability (See appendix Table 6). In 1933, the expenses were only \$1,302 and in 1940 were up to \$6,590, a range of \$5,288.

The average annual amount spent for rent, taxes, and interest was \$1,092, which was nearly 40 percent of the total cash expenses. The operator was not able to reduce these costs in poor years nearly as much as the other expenses. In 1933, a poor year, total cash expenses were low and 65 percent were fixed costs (rent, taxes, and interest).

33. The purchase of land, and livestock is considered as a cash expense here because that was the practice followed during the early years of the study.



Source: Appendix table 6.

Fig. 9. Financial Summary of a Cattle-Sheep Ranch, Northwestern South Dakota, 1931-1940.

In 1931, 3,220 acres were operated. This was gradually increased until in 1940 the operator had 7,300 acres under his control (See Fig. 10). Only about 100 acres were cultivated each year and most of that was devoted to feed crop production.

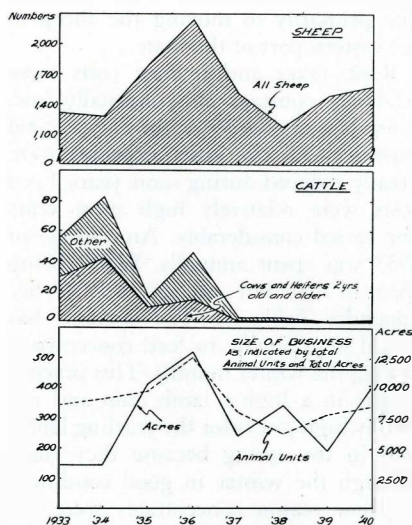
The total animal units increased from 109 in 1931 to 188 in 1934 (See Fig. 9). Because of the drouth in 1934 the number was reduced that year to 133, was up to 141 in 1936, and down again in 1937 to 120. The drouth of 1936 forced the operator to reduce his total animal units by only 14 percent which was a small reduction as compared to other ranchers in the area. During the last three years of the period the number increased steadily reaching 225 in 1940.

The cattle numbers follow about the same trend as the animal units ex-

cept there was no sharp increase in 1939 and 1940. The increase in total animal units during these years was due primarily to the expansion of the sheep enterprise. A few sheep were kept as far back as 1934, but the enterprise did not become important until 1937 when the number had increased to 192, and by 1940 there were 677 sheep on this ranch.

The average calf crop from cows, twos and ones over the period was 78.5 percent. In 1935 the calf crop was 97.2 percent and in 1937 was down to 37.5 percent. Despite the poor calf crop of 1937, the operator was well above the average. Moreover, the death loss was only 4.0 percent which was below the average. The high calf crop and low death loss were important factors in maintaining his relatively high income.

The operator made two important adjustments over the 10-year period. First, the total acreage was increased



Source: Appendix table 6.

Fig. 10. Livestock Organization of a Cattle-Sheep Ranch, Northwestern South Dakota, 1931-1940.

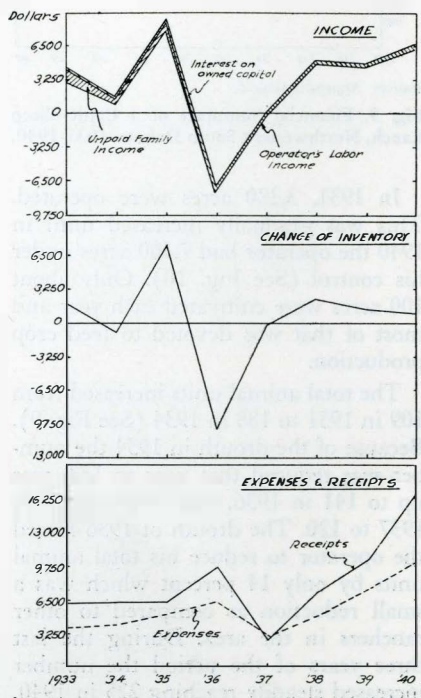
to accommodate more and better conditioned livestock. Second, the sheep enterprise was developed following the drouth of 1936, probably to facilitate a more rapid recovery.

An Example of a Profitable Sheep Ranch. During the period 1933-40, the operator's average labor income was \$2,294, the highest for any of the co-operating ranches. However, the income probably would have been considerable lower if records were available for 1931 and 1932. A negative income was received during only 1936 and 1937 (See Fig. 11). The low income in 1936 was primarily the result of a high death loss (434 head or 19 percent died) and an exceedingly poor lamb crop. Of course, the low prices and poor range also had an important effect on the income. In 1937, the income was low for the same reasons, the death loss being 226 head or 15 percent and a lamb crop being considerably below average, due primarily to moving the sheep to the eastern part of the State.

Rent, taxes and interest costs were relatively constant and unusually low, consisting of only 19 percent of the total expenses. All the other expenses were greatly reduced during some years. Feed costs were relatively high most years but varied considerably. An average of \$953 was spent annually, \$2,061 being spent in 1936, but only \$60 in 1938 (See appendix Table 7). The operator has found it profitable to feed concentrates during the winter months. This practice results in a higher lamb crop and relatively high prices for the yearling lambs sold in the spring because they come through the winter in good condition. Another reason concentrates were fed on this ranch was because during later years, native hay has been the only source of roughage, no crops being planted since 1935.

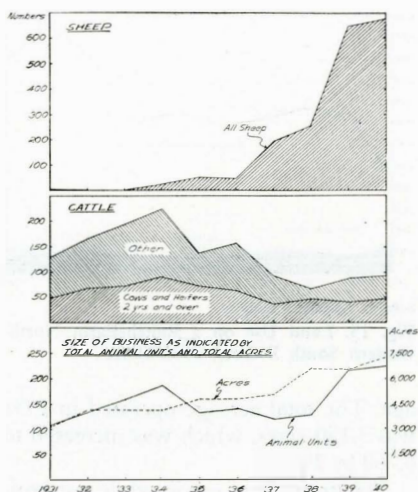
The total acreage was increased from 3,631 acres in 1934 to 10,231 in 1935, and further to 13,046 in 1936 (See Fig. 12). These increases enabled the operator to carry his larger amount of livestock through 1934 and 1935. The cattle decreased considerably during 1934, but the increase in sheep numbers more than off-set this reduction.

In 1936, it was necessary to reduce the sheep number by nearly 36 percent and in 1937 by another 22 percent. It was also necessary to sell nearly all the cattle in 1936 so that a maximum number of breeding ewes could be carried through the winter. In recent years the number of sheep has been gradually in-



Source: Appendix table 7.

Fig. 11. Financial Summary of a Sheep Ranch, Northwestern South Dakota, 1933-1940.



Source: Appendix table 7.

Fig. 12. Livestock Organization of a Sheep Ranch, Northwestern South Dakota, 1933-1940.

creased and a few head of cattle have also been added to the organization.

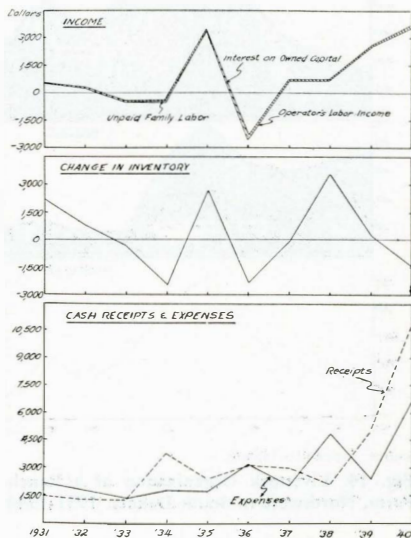
An Example of a Ranch-Farm Combination. Ranch-farm combination units didn't make out as well as ranches over the period 1931-40, when an allowance is made for interest on operator's investment. During the 10-year period the operator's labor income averaged a negative \$442 (See Fig. 13). However, the interest on owned investment, figured at 3.5 percent, averaged \$1,600 annually (which was much higher than for other ranch examples given above) and this gave the family something to live on even if part of this was required to meet operating expenses.

The operator's labor income, cash receipts, and cash expenses were all much more stable than on the ranches, and the reason seems to be that some cultivation along with the livestock enterprises helps to furnish feed in dry years, and even additional income during the years when

cash grain crops can be raised (See appendix Table 8). In 1937, the cash receipts would have been very low if \$1,878 worth of crops hadn't been sold.

Until 1935, the number of animal units increased steadily, but declined 55 percent by 1938 (See Fig. 14). The decline in 1935 appears to have been voluntary because prices and range conditions were about average, but in 1936, most sales were forced, and in 1937 still more livestock was sold than raised, probably to secure funds to meet current operating expenses.

The sheep enterprise showed a decided gain over the period while cattle numbers fell off noticeably. In 1931, the ranch carried 307 sheep and in 1940 there were 526. Cattle were quite an important source of income in the early and middle 1930's but a large part of them were sold as a result of the 1936 drouth and the numbers have not been

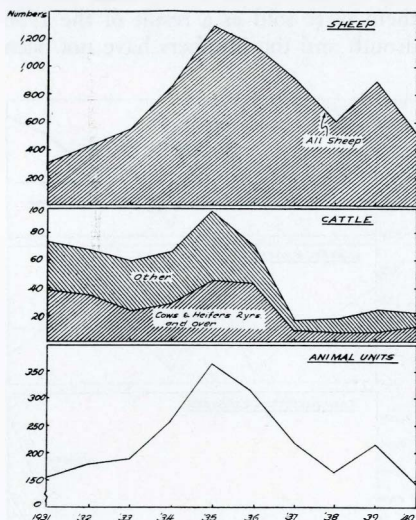


Source: Appendix table 8.

Fig. 13. Financial Summary of a Ranch-Farm, Northwestern South Dakota, 1931-1940.

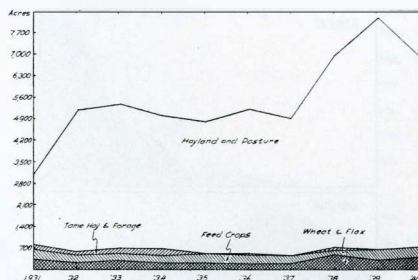
increased much since. Hogs were also an important enterprise during the early part of the period, but in 1934 most of them were sold because of the local grain shortage.

The production of cash grain and feed crops has been an important enterprise throughout the 10-year period. During years such as 1931, 1934 and 1936, very little if anything was produced. However, in most of the other years some crops were raised which furnished feed for the livestock while others such as wheat and flax were sold as cash crops. The average annual wheat and flax acreage was 304 acres, the highest being 503 acres in 1938 (See Fig. 15). An average of 650 acres were cultivated each year leaving 346 acres for the production of feed grain, tame hay and for-



Source: Appendix table 8.

Fig. 14. Livestock Organization of a Ranch-Farm, Northwestern South Dakota, 1931-1940.



Source: Appendix table 8.

Fig. 15. Land Use on a Ranch-Farm Northwestern South Dakota, 1931-1940.

age. The total acreage operated in 1931 was 3,150 acres, which was increased to 6,760 by 1940.

The growing of crops, while not profitable during many years, tends to facilitate flexibility of the ranch-farm organization. When crops are produced, concentrate consuming livestock such as hogs are fed. When crops fail the hogs can all be sold without a great loss, and breeding stock can be purchased again without too much expense when feed is available. It was also the policy on this ranch to feed out the lambs during years when grain was available and to sell them as feeders when feed is short. Considerable roughage production enabled the rancher to go through 1934 without decreasing his roughage consuming livestock at all which was unusual in the area. A reduction was necessary in 1936, because the reserves of roughage were all gone by that time.

Large amounts were spent in planting and caring for the crops during some years when little or no return was received. These losses must be made up during good years if crop production is to be profitable.

Appendix Tables

Table 1. Average receipts, expenses and income per animal unit on cooperating ranches, Northwestern South Dakota, 1931-40*

Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Ranches Reporting**	19	20	19	17	16	17	13	15	14	14
Animal Units per Ranch	233	238	251	270	240	242	159	154	193	193
Total Receipts per A. U.	\$19.38	16.16	11.13	7.47	22.45	.68	28.00	30.37	33.51	38.76
Total Expenses per A. U.	\$19.48	17.50	14.40	11.38	15.89	19.13	25.41	23.35	23.44	26.80
Operator's Labor Income per A. U.	\$- .10	-1.34	-3.27	-3.91	6.56	-18.45	2.59	7.02	10.07	11.96

* Calculation of animal units: One cow with or without calf at side under six months was considered a unit; one bull 1.25 units; 1 2-year old beef animal .80 of a unit; 1 1-year old beef animal .60 of a unit; one horse 1.25 units, 5 sheep a unit; 8 hogs a unit; 25 turkeys a unit; and 100 chickens a unit.

** Eleven of these ranches kept records during the whole period and one other kept them for the last eight years.

Table 2. Average number of animal units on four cooperating ranch-farms and ten ranches, western South Dakota, 1931-1940.

Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	a.u.	a.u.	a.u.	a.u.	a.u.	a.u.	a.u.	a.u.	a.u.	a.u.
Ranch-Farms	118	130	145	166	182	182	124	108	128	108
Ranches	219	224	289	304	278	292	163	175	215	203

Table 3. Range conditions in Butte, Corson, Dewey, Harding, Perkins, and Ziebach Counties, South Dakota, 1929-1940.

PERCENT OF NORMAL												
Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1929	91	86	79	85	85	90	93	84	79	87	86	87
1930	79	79	83	86	95	95	88	78	80	80	84	79
1931	83	88	88	85	81	70	68	59	66	64	70	59
1932	67	59	60	64	78	96	101	91	89	89	87	89
1933	86	87	82	82	84	96	76	77	75	76	76	77
1934	74	76	70	66	61	43	61	45	38	44	47	51
1935	45	51	51	48	65	83	94	84	83	76	76	85
1936	81	75	66	76	76	59	33	34	25	40	34	36
1937	39	41	36	37	49	57	77	82	72	74	74	68
1938	70	75	72	74	70	78	71	74	65	72	69	77
1939	76	72	68	70	70	63	84	77	80	79	77	81
1940	76	76	72	78	81	89	84	87	89	84	86	83

Source: U. S. D. A., Agricultural Marketing Service, Sioux Falls, South Dakota.

Table 4. Operator's labor income and total animal units on cooperating ranches, Northwestern South Dakota, 1932, 1936, and 1939.

	1932		1936		1939	
	Total Animal Units	Operator's Labor Income	Total Animal Units	Operator's Labor Income	Total Animal Units	Operator's Labor Income
		Dol.		Dol.		Dol.
	225	3738	290	-834	451	10,284
	423	3323	81	-1001	144	4,219
	134	1748	192	-1879	313	4,155
	149	1312	313	-2245	215	3,223
	313	1101	158	-2364	186	2,678
	216	-484	141	-2671	216	2,649
	134	227	131	-2676	137	1,960
	588	110	142	-2895	221	1,504
	60	-122	368	-3405	125	1,120
	138	-275	279	-4498	104	1,015
	76	-484	292	-5137	117	-4
	146	-485	239	-5167	68	-57
	178	-740	193	-5243	217	-446
	209	-1101	171	-5654	183	-547
	446	-1127	193	-6297		
	131	-1164	503	-7828		
	226	-1806	423	-14185		
	307	-2122				
	289	-3116				
	270	-3764				

Table 5. Financial summary and organization of a cattle ranch, Northwestern South Dakota, 1926-1940*

SECTION A. Summary of Cash Receipts													
Item	1926	1927	1928	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Cattle	5590	6632	7173	8330	2109	1651	5723	484	5075	527	276	3478	3303
Other	529	18	805	650	354	—	63	254	175	175	184	179	339
Total Receipts	6110	6650	7978	8980	2463	1651	5786	738	5250	702	460	3657	3642

* Records for 1929 and 1930 are not available.

SECTION B. Summary of Expenses													
Item	1926	1927	1928	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Rent	273	283	321	351	260	248	232	296	261	180	274	309	314
Taxes	441	456	358	382	358	349	243	256	260	224	237	242	265
Interest	320	327	160	132	—	—	16	—	—	14	30	94	28
Hired Labor	256	268	639	462	430	296	253	397	221	300	87	618	423
Feeds and Seeds	296	—	41	206	524	371	586	59	1735	141	182	163	18
Other	1738	793	4837	503	1095	480	391	968	1810	314	114	867	621
Total Expense	3324	2127	6356	2036	2667	1744	1721	1976	4287	1173	924	2293	1669

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SECTION C. Summary of Income

Item	1926	1927	1928	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Total Cash Receipts	6110	6650	7978	8980	2463	1651	5786	738	5250	702	460	3657	3642
Total Cash Expenses	3324	2127	6356	2036	2667	1744	1721	1976	4287	1173	924	2293	1669
	2786	4523	1622	6944	-204	-93	4065	-1238	963	-471	-464	1364	1973
Change in Inventory	-85	7742	5599	-5819	1890	-1120	-3954	3217	-5045	1368	1346	1597	2080
Interest on Owned Capital @ 3½%*	1318	1333	1668	1423	1202	1227	1157	1054	1161	986	981	1001	1092
Credit to Family Labor	—	—	—	—	—	—	—	—	—	—	—	—	—
Operator's Labor Income	1383	10932	5553	-298	484	-2440	-1046	925	-5243	-89	-99	1960	2961

* Based on beginning inventory.

SECTION D. Tenure and Use of Land

Item	1926	1927	1928	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.
Owned	2360	2360	2360	2360	2360	2360	2360	2360	2360	2320	2320	2320	2320
Rented	2620	2620	2620	*5600	4920	4960	4960	4960	4960	5820	5820	5820	5820
Total	4980	4980	4980	7260	7280	7320	7320	7320	7320	8140	8140	8140	8140
Crop Land	65	82	157	160	274	168	60	65	—	132	41	41	81
Hay Land and Pasture	4915	4898	4823	7200	7006	7152	7260	7255	7320	8008	8099	8099	8059

* 40 acres free.

SECTION E. Livestock Organization*

Item	1926	1927	1928	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Total Animal Units	294	268	281	287	216	236	269	157	193	75	102	137	148
Cows & Heifers 2 years and over	151	121	143	112	113	119	133	96	108	30	67	63	65
Other Cattle	172	179	143	248	137	161	188	74	114	49	26	90	104
Total Cattle	323	300	286	360	250	280	321	170	222	79	93	153	169
Total Horses	12	12	9	12	14	14	14	12	11	11	14	14	14
Total Hogs	2	—	—	—	—	—	—	—	—	—	—	—	1
Total Chickens	—	—	—	60	60	60	60	40	50	11	48	75	75

* Beginning inventory.

Table 6. Financial summary and organization of a cattle-sheep ranch, Northwestern South Dakota, 1931-1940

SECTION A. Cash Receipts										
Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Cattle	1123	1235	1190	3552	2117	2255	2045	628	1505	1752
Sheep and Wool	—	—	—	98	86	740	940	1267	3370	9577
Other	322	20	42	144	227	176	70	290	268	438
Total Receipts	1445	1255	1232	3794	2430	3171	3055	2185	5143	11,767

SECTION B. Cash Expenses										
Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Rent	166	235	202	161	230	250	288	344	411	395
Taxes	138	150	153	119	131	52	55	61	116	182
Interest	840	840	495	661	568	605	669	696	935	767
Hired Labor	55	42	27	—	42	76	146	287	308	813
Feeds & Seeds	211	125	139	634	58	1166	310	256	389	490
Other	1702	396	286	222	672	1125	694	3329	385	3943
Total Expense	3112	1788	1302	1797	1701	3274	2162	4973	2544	6590

SECTION C. Summary of Income										
Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Total Cash Receipts	1445	1255	1232	3794	2430	3171	3055	3185	5143	11767
Total Cash Expenses	3112	1788	1302	1797	1701	3274	2162	4973	2544	6590
Change in inventory	-1667	-533	-70	1997	729	-103	893	-2788	2599	5177
Interest on Owned Capital @ 3½%*	2167	818	-346	-2416	2733	-2340	-128	3590	169	-1446
Credit to Family Labor	16	58	51	24	85	228	73	80	119	220
Operator's Labor Income	—	—	—	61	—	—	—	—	—	—
	484	277	-467	-504	3377	-2671	692	722	2649	3511

* Based on beginning inventory.

SECTION D. Tenure and Use of Land										
Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.
Owned	880	880	880	880	880	880	880	880	1040	2000
Rented	2340	3300	3300	3300	3940	3940	4190	5750	5540	5300
Total	3220	4180	4180	4180	4820	4820	5070	6630	6580	7300
Crop Land	102	140	78	88	210	63	80	82	102	70
Hayland and Pasture	3118	4040	4102	4092	4610	4757	4990	6548	6478	7230

SECTION E. Livestock Organization*										
Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Total Animal Units	109	134	157	185	133	141	120	127	216	225
Cows & Heifers 2 years and over	49	69	72	90	72	63	37	46	40	47
Other Cattle	82	97	122	134	66	94	55	22	47	46
Total Cattle	131	166	194	224	138	157	92	68	87	93
Total Sheep	2	—	—	26	52	49	194	259	645	677
Total Hogs	19	1	3	5	4	3	1	3	4	3
Total Chickens	50	100	90	55	40	45	32	45	50	60
Total Turkeys	30	10	4	—	—	—	—	—	—	—

* Beginning inventory.

Table 7. Financial summary and organization of a sheep ranch, Northwestern South Dakota, 1933-1940

SECTION A. Cash Receipts								
Item	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Cattle	50	1284	205	1100	—	140	—	105
Sheep and Wool	5828	4440	6638	7087	2680	6450	10117	16218
Other	125	470	—	1361	—	450	400	300
Total Receipts	6003	6194	6843	9548	2680	7040	10517	16623

SECTION B. Cash Expenses								
Item	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Rent	232	198	455	668	235	217	200	828
Taxes	170	175	222	154	238	150	183	250
Interest	880	660	360	360	375	410	462	396
Hired Labor	354	300	785	1603	851	705	935	1090
Feeds and Seeds	1019	60	1022	2061	712	88	1576	1082
Other	1187	2385	2166	1359	635	3011	4025	7105
Total Expenses	3842	3778	5010	6205	3046	4581	7381	10751

SECTION C. Summary of Income								
Item	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Total Cash Receipts	6003	6194	6843	9548	2680	7040	10517	16623
Total Cash Expenses	3842	3778	5010	6205	3046	4581	7381	10751
	2161	2416	1833	3343	-366	2459	3136	5872
Change in inventory	1696	-878	7062	-10389	200	2359	1352	929
Interest on Owned Capital @ 3½% *	150	167	306	782	324	402	333	475
Credit to Family Labor	630	630	630	—	—	—	—	—
Operator's Labor Income	3077	741	7959	-7828	-490	4416	4155	6326

* Based on beginning inventory.

SECTION D. Tenure and Use of Land								
Item	1933	1934	1935	1936	1937	1938	1939	1940
	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.
Owned	286	286	286	286	286	286	286	286
Rented	3395	3395	7020	9760	2700	5760	3700	9800
Free	—	—	3000	3000	3000	2500	960	—
Total	3681	3681	10306	13046	5986	8546	4946	10086
Crop Land	75	50	75	—	—	—	—	—
Hayland and Pasture	3606	3631	10231	13046	5986	8546	4946	10086

SECTION E. Livestock Organization*								
Item	1933	1934	1935	1936	1937	1938	1939	1940
	No.	No.	No.	No.	No.	No.	No.	No.
Total Animal Units	345	365	392	503	323	253	313	341
Cows and Heifers 2 years and over	30	42	10	15	1	1	—	1
Other Cattle	26	41	6	31	2	2	—	1
Total Cattle	56	83	16	46	3	3	—	2
Total Sheep	1306	1279	1790	2249	1530	1175	1483	1587
Total Hogs	5	1	2	—	—	—	—	—
Total Chickens	35	35	68	—	24	—	24	30
Total Turkeys	20	20	—	—	—	—	—	—

* Beginning inventory.

Table 8. Financial summary and organization of a ranch-farm, Northwestern South Dakota, 1931, 1940

SECTION A. Cash Receipts										
Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Cattle	1065	490	—	1616	1303	2166	90	486	811	727
Sheep and Wool	323	556	3527	2144	2471	3829	2253	5540	5229	2669
Other	1881	2969	1758	1720	2417	2093	5022	3112	1891	3802
Total Receipts	3269	4015	5285	5480	6191	8088	7365	9138	7931	7198

SECTION B. Cash Expenses										
Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Rent	385	524	499	367	403	405	514	343	471	257
Taxes	532	534	511	465	655	270	278	459	395	581
Interest	96	96	96	96	152	96	96	28	93	—
Hired Labor	790	625	680	513	966	648	685	560	595	490
Feeds and Seeds	580	228	22	779	167	1127	1230	68	769	388
Other	1367	2298	1381	1257	2705	1073	6383	5462	3220	1797
Total Expenses	3750	4305	3139	3477	5048	3619	9186	6920	5543	3513

SECTION C. Summary of Income										
Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Total Cash Receipts	3269	4015	5285	5480	6191	8088	7365	9138	7931	7198
Total Cash Expenses	3750	4305	3189	3477	5748	3619	10186	6920	6343	4413
	-481	-290	2086	2003	443	4469	-2821	2218	1588	2785
Change in Inventory	-83	1022	970	-1799	317	-4775	3583	301	-436	1050
Interest on Owned Capital @ 3½ %*	1497	1472	1502	1533	1702	1844	1523	1725	1598	1611
Credit to Family Labor	—	—	190	95	95	95	95	—	—	—
Operator's Labor Income	-2061	-740	1374	-1424	-1037	-2245	-856	794	-446	2224

* Based on beginning inventory.

SECTION D. Tenure and Use of Land										
Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.
Owned	2440	3080	3080	3080	3080	3480	3480	3480	3880	3880
Rented	710	2070	2310	1990	1750	1750	1460	3470	4310	2880
Total	3150	5150	5390	5070	4830	5230	4940	6950	8190	6760
Crop Land:										
Wheat	190	115	250	215	231	215	228	504	347	427
Oats	46	55	90	36	90	46	16	89	56	75
Barley	40	70	75	115	50	76	90	46	100	76
Corn	110	110	110	15	70	120	85	45	76	53
Legume Hay	160	146	147	160	10	46	—	36	—	—
Corn Fodder	—	—	—	50	10	—	—	—	—	—
Flax	120	115	38	—	46	—	—	—	—	—
Other Crops	135	15	10	89	45	—	52	—	106	110
Total Crop Land	801	626	720	680	552	503	471	720	685	741
Hayland and Pasture	2349	4524	4670	4390	4278	4727	4469	6230	7505	6019

SECTION E. Livestock Organization*

Item	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Roughage consuming animal units	142	160	177	253	357	308	217	161	214	141
Concentrate consuming animal units	15	18	12	6	6	5	6	3	3	5
Total animal units	157	178	189	259	363	313	223	164	217	146
Cows and Heifers 2 years and over	39	35	23	28	45	43	9	9	7	11
Other Cattle	34	33	37	39	51	28	7	8	16	11
Total Cattle	73	68	60	67	96	71	16	17	23	22
Total Sheep	307	437	553	874	1306	1161	934	621	910	526
Total Hogs	96	114	77	31	32	35	28	26	7	16
Total Chickens	300	350	220	250	165	125	180	120	175	250
Total Turkeys	11	5	2	—	—	—	—	—	—	—

* Beginning inventory.