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Range Cattle Management On the Jornada Range

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WITH A GREAT DEMAND FOR beef at good prices, such as prevails today, there is apt to be less and less attention given to the various management aspects of operating cattle outfits. Yet, as every seasoned cattleman knows it is just as important and perhaps even more so to keep a line on range management costs and income during good times as during lean years. During good years there is a greater chance of management factors getting out of balance, which may lead to later difficulties. Then, too, no one knows when or how quickly the fat years will turn to lean. This is particularly so in the Southwest where cattle ranching is influenced by many factors, some of which, particularly drought, are beyond control of the operator. In this region good range management practices have a direct bearing on costs and returns which in the end tell whether or not a stockman stays in business.

Aside from the personal gain and insurance to the individual stockman by closely watching his outfit to see that the best management practices are followed, the present war emergency which may be of long duration adds a national duty to keep operations in balance, particularly numbers of livestock and available range forage, so that maximum meat production may be maintained. The western stockman must make the most efficient use of his range lands in order to meet the increasing demands for range livestock products and at the same time avoid overstocking, overcapitalization, and other pitfalls of the first World War.

The limitations of the written word are fully realized in attempting to tell anyone how to make a success of a business such as cattle ranching, where

experience and shrewdness of the operator weigh so heavily. However, the purpose of this article is to present briefly some of the main factors involved in a typical cattle operation of the Southwest and to point out the costs and returns which may be expected when both range and livestock are under careful management, as an aid to keep range cattle operations on an even keel during the present emergency. The data presented pertain to the Jornada Experimental Range, a branch of the Southwestern Forest and Range Experiment Station, located in south-central New Mexico, and cover the 10-year period 1928-37.

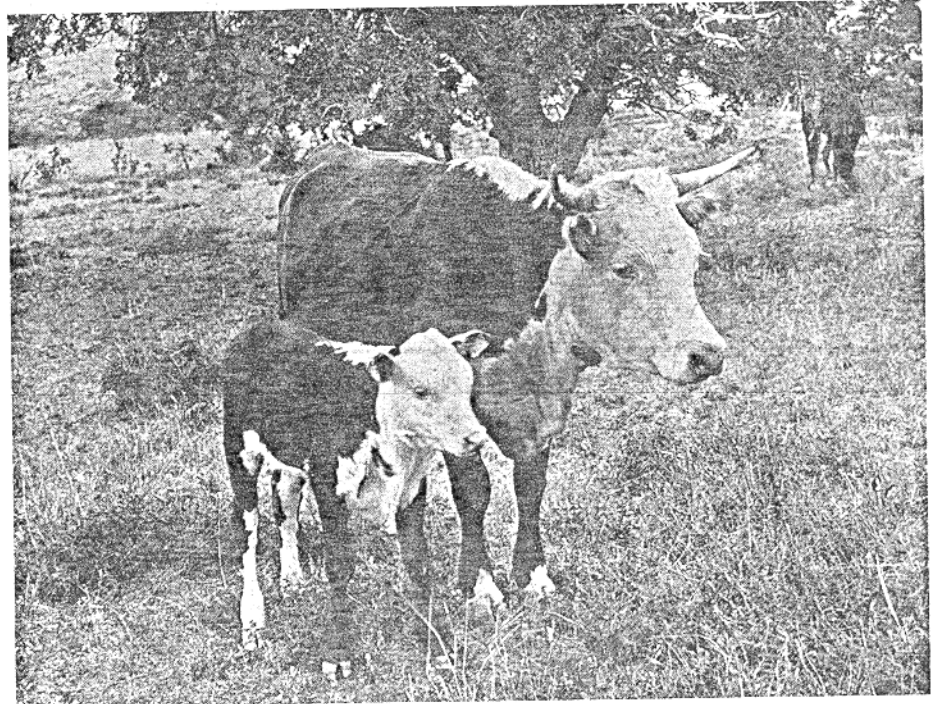
Some Features of the Jornada Experimental Range

The Jornada Experimental Range includes an area of 193,000 acres and is similar in topography, climate, and

vegetation to large areas of semidesert range lands in the Southwest.

Range types on the Jornada are varied and embrace some of the best as well as some of the poorest of the semidesert ranges. Black grama is the most important forage plant. Tobosa grass also occupies a considerable area, but is definitely of secondary value because of its lower palatability. Nearly a third of the Jornada is made up of mesquite sandhill range. The mesquite itself is of little grazing value, but the chamiza browse and weeds found in the type furnish early spring feed. Creosotebush and tarbush occupy large areas. Neither of these shrubs, however, has any value as forage for livestock, but a few palatable grasses grow within these types.

The cattle that graze the Jornada Experimental Range are owned by a practical stockman who uses the range under a co-operative arrangement with the secretary of agriculture through the Southwestern Forest and Range Experiment Station. Plans for rate of stocking, distribution, management, and handling of the livestock are worked out jointly with the co-operator, who pays into a federal co-operative fund the



How much does she earn?

* The authors gratefully acknowledge the assistance rendered by the clerical workers of WPA Statistical Project No. 2123 in the preparation and compilation of cost and other data used in this manuscript.

Mr. Ares is range superintendent and Mr. Valentine was formerly junior range examiner at the Southwestern Forest and Range Experiment Station, which is maintained by the Forest Service for Arizona, New Mexico, and west Texas, with headquarters at Tucson, Ariz.

equivalent of grazing fees and is required to maintain all ranch and range improvements at his own expense.

While the area is broken up into a few pastures largely separating the summer-fall range from the winter-spring range, the main pastures are large and distribution is obtained through the use of salt and water plus the customary range riding.

The low grazing value of the range has been an ever present limit to the number of developments economically feasible, and such developments made are within the limits of the ordinary cattle outfit. Thus the range, improvements, operation, and economic problems of the Jornada operator are similar to and representative of those of many other livestock operators in the Southwest.

Management Objectives

The management of the Jornada is built around the necessity of maintaining the black grama range—by far the most valuable range type on the area—in good productive condition and at the same time making as much use of the lower value range types as is consistent with the maintenance of the black grama range. Cattle are for the most part removed from the black grama pastures during the summer-fall growing season and held on the tobosa grass range and on the other range types producing a preponderance of summer palatable forage. In this way a higher degree of use is obtained of the summer range than would be possible if the cattle were permitted to use the entire area during the summer, since a greater efficiency of the entire range is obtained by consuming range forage which might be either wasted or reduced in yield by untimely and heavy grazing.

One of the most disconcerting problems of management on the Jornada, as elsewhere in the Southwest, is imposed by the extreme fluctuation of forage production from year to year. Drought years are common. During the drought of 1934 forage produced was insufficient for 800 head of cattle yearlong. In contrast, in the exceptionally good years of 1915 and 1938 forage was sufficient to graze over 2,500 head yearlong. Few years have been close to what may be called average forage production. From the 25 years of study and operation on the Jornada it has been clearly shown that the average annual forage production is not a satisfactory basis for stocking the range because of the frequency of occurrence of years in which forage production is well below the average. Stocking should be based on not more than 75 per cent of average forage production. This leaves a 25 per cent forage reserve for dry years. On this basis an adequate amount of forage has been available in all but a few extremely dry years. Low death losses, good calf crops, a minimum of supplemental feeding, and preservation of the forage resource have demonstrated the desir-

Table 1.—Investment per Breeding Cow, Jornada Experimental Range, 1928-37

Livestock	\$ 52.87
Water developments	29.00
Fences	23.84
Headquarters buildings	1.73
Equipment	1.67
Land .....	.48
Current operating capital	5.17
Total	\$114.76

ability of this conservative basis of stocking.

The Period Reported

The period 1928 to 1937 did not represent unusually favorable conditions for livestock production. On the contrary, there were several factors involved in the operation during the period which adversely affected costs and returns. Rainfall for the 10-year period was slightly below the 9.07-inch annual average as indicated by the records from 1915 to 1939, the period having included the unprecedented drought of 1934. Average annual forage production for the period was 14 per cent below the average for the 1915-39 period.

In 1928 cattle prices reached their highest peak since the post-war depression and at that time large purchases were made for the Jornada herd at the top prices of \$80 for a cow and calf. Prices began to decline during the latter part of 1929 and by 1932 had reached a very low figure. The resulting reduction in inventory values during this period wiped out all the profits made in 1928 and 1929. In 1933 a change of co-operators made necessary heavy liquidations by the retiring co-operator and purchases of large numbers of replacement cattle by the incoming co-operator for the experimental herd at prices that were rising slightly. No sooner had the shift in co-operators been made than the severe drought of 1934 forced heavy and costly liquidation of cattle through the government drought-relief program. More favorable climatic conditions and rising markets during the latter years of the study made economic recovery possible. All these factors have influenced the costs and returns of the Jornada operation.

Investment Per Breeding Cow³

The breeding herd on the Jornada for

³ All well-managed business firms make a practice of taking inventory every year, figuring costs and income for the purpose of determining the current status of the enterprise and to correct, if possible, unsatisfactory conditions, reduce costs, and in general work toward greater efficiency. In order to do this it is necessary to analyze the operation of the business closely each year.

Mont H. Saunderson has prepared an excellent system of cost accounting which has been especially designed for stockmen. This accounting system is in effect on the Jornada Experimental Range, and has been used in this book-keeping system.

These sets, which include all the necessary forms for keeping ranch cost accounts, can be secured from the American National Live Stock Association, Denver, Colo., at \$2.50 per set.

the 1928-37 period averaged 998 cows. Investment of capital per breeding cow is shown by table 1.

The total capital invested in the Jornada operation during the period averaged \$114.76 per breeding cow. Of this amount \$52.87 was investment in livestock; \$54.57 in improvements, including water developments, fences, corrals, and buildings; the investment in equipment was \$1.67 and in land \$0.48. The only land on the ranch owned by the co-operator consisted of eight scattered 40-acre tracts on which were located most of the permanent water developments. The remainder of the land was government owned for the use of which the co-operator paid an annual grazing charge on a per-head basis. Average annual investment in borrowed operating capital amounted to \$5.17 per breeding cow.

Costs and Returns Per Breeding Cow

Average annual costs and returns per breeding cow are shown by table 2. The average gross annual income per breeding cow was \$15.68. Annual sales of cattle are made regularly. Average annual operating costs totaled \$8.65. This cost included all expenses which were likely to be incurred in the operation of the average ranch in the Southwest with the exception of the operator's wages of management and interest on his investment. These two important items share together the net income or difference between gross income and operating costs. Cattle depreciation and death loss and cost of replacements do not appear as items of direct cost but are accounted for through their effect on the gross receipts and purchases. Replacements were made from calves produced on the ranch and by purchase. The cost of replacements made by holding calves produced on the ranch was manifested as curtailed revenue from sales, while cost of replacements made by purchase was manifested as increased purchases of cattle.

The largest items of expense to the co-operator were labor, grazing charges, and depreciation. The total labor expense, including both cash and supplies bought for labor, amounted to \$2.51 per breeding cow. The labor item includes the services of a foreman and one laborer yearlong, with additional hands hired during the periods of heavier work. Grazing charges represent the charge

made by the Forest Service for use of the range forage. Depreciation, including depreciation of range improvements, equipment, automobile, and buildings amounted to an average of \$1.77. Depreciation costs were arrived at by applying appropriate depreciation rates to the initial appraised values. The rates of depreciation used were based on tables prepared by the Bureau of Internal Revenue, and those used were dependent on the expected life of the item concerned. Wells and fences, with an expected life of 40 years, were depreciated at 2½ per cent per year. Steel storage tanks and watering tubs, with a 25-year expected life, were depreciated at 4 per cent per year, and buildings, with a 50-year expected life, were depreciated at 2 per cent per year. Equipment was depreciated at 10 per cent per year.

The average annual return to the co-operator during the period of study, after deducting items of expense as listed, was \$7.03 per breeding cow, making a total return of \$7,016. This amount was sufficient to provide an annual return of 4 per cent on the investment and the sum of \$2,645 as compensation for the co-operator's managerial ability. It should be emphasized, of course, that these figures are averages for the 10-year period; in the better years greater returns were made and in the poorer years lesser returns were made.

Good Management Necessary

It has become increasingly evident from the Jornada operation that good management of range and cattle are necessary to make good returns. This has required careful advanced planning, followed by close adherence to the essential features of the plans. The main objective in the plans has been to keep cattle numbers at such a level as to insure an adequate forage supply in the majority of years. A few factors of management in particular have been found to be especially important in contributing to the success of the operation.

Good Distribution of Cattle Increases Returns

Of no little importance in contributing to the returns was good distribution of cattle on the range. This resulted in good use of forage lying out from the permanent water developments without undue damage to the range lying closer in. It is to be desired, of course, that distribution be had by an adequate system of permanent water developments. However, these are costly, and there are economic limits to the number of such improvements that can be made on the range. The analysis of the Jornada operation has shown that investment in range improvements was about at the economic limit. The practice of placing salt out in the pastures in areas of good forage and the location of small inexpensive tanks in such areas is credited with greatly aiding distribution and efficient use of the range.

Calf Crop Percentage Contributes Heavily to Success

The average calf crop percentage for the period was 71.7. This average was adversely influenced by the 1934 and 1935 calf crop percentages which were 62.9 and 61.2, respectively, and were due to the introduction of a new breeding herd in 1933 and the severe drought in 1934. The otherwise good calf crop percentages were obtained by building up a herd of young, high-grade breeding cows and by stocking so as to have an adequate supply of forage for this herd. Old and barren cows have been culled out closely in order to eliminate unproductive animals from the herd. In the five years following 1937, which includes several favorable years, the calf crop percentage has exceeded 85 per cent. Including these years with previous 10-year period as reported would have increased the returns per breeding cow markedly. The average calf crop for the 10-year period from 1915 to 1925 reported by Schoeller in *THE PRODUCER* (Vol. IX, No. 5, Oct. 1927) was 65 per cent, the maximum being 83.2 per cent in 1920, and the minimum 43.7 per cent in 1919 as the result of the drought of 1918. The higher calf crop since 1925 and particularly during recent years further illustrates the benefits of improved management practices as brought out by experience and study over the years.

The importance of obtaining high calf crop percentages is clearly evident in the present analysis. Study of the data showed that a 40 per cent calf crop was necessary barely to meet all operating expenses without providing any

return to the co-operator for his investment of money and only \$20.0 per year for his wages of management. Only after the 40 per cent calf crop level was passed did the co-operator begin to share in the return from the operation, and only after the 60 per cent level was reached did he receive what might be considered as a satisfactory return on his investment.

Low Death Losses Help to Increase Returns

The long-time average death loss from all causes on the Jornada is 1.7 per cent; for the 10-year period reported it was slightly higher—1.8 per cent. This low figure has contributed in no small way to the return from the operation. Starvation, once a major cause of losses on southwestern ranges, has been all but completely eliminated through better management, chiefly more conservative stocking. Weak, old, and unthrifty animals are also promptly culled and sold. Calves are vaccinated each year. Control of poisonous plants has been given special attention. Certain of the larger areas have been fenced and cattle excluded from them during the danger period. Other smaller areas have been grubbed to reduce the number of poisonous plants. The stocking practice has not only provided adequate forage but also has had a marked influence in preventing losses from poisonous plants.

Conservative Stocking a Fundamental Factor

Without a doubt, the single factor in a successful and sustaining livestock opera-

Table 2.—Average Annual Costs and Income per Breeding Cow, Jornada Experimental Range, 1928-37

Gross receipts and income per breeding cow:	
Gross receipts from all cattle sales.....	\$29.45
Inventory increase ¹ .....	.06
Total gross receipts	29.51
Less total cattle purchases	13.83
Gross income	\$15.68
Operating costs per breeding cow:	
Labor, cash	\$ 1.97
Provisions and supplies for labor .....	.54
Grazing charges	1.98
Supplemental feed and salt .....	.61
Cattle supplies .....	.07
General ranch expense .....	.25
Taxes .....	.59
Repairs, building .....	.02
Repairs, equipment and range improvements .....	.31
Repairs, automobile .....	.09
Gasoline, oil, and grease .....	.14
Interest on borrowed operating capital, 6% .....	.31
Depreciation, buildings .....	.03
Depreciation, equipment .....	.17
Depreciation, range improvements	1.49
Depreciation, automobile .....	.08
Total operating cost	\$ 8.65
Net income to co-operator	\$ 7.03

¹ Average value of cattle numbers at close of study December 31, 1937, in excess of cattle numbers at outset January 1, 1928.

tion, as brought out by the Jornada data, is conservative stocking. Stocking so that not more than 75 per cent of the average annual forage crop is used will provide adequate forage in most years. The remaining 25 per cent, which is sometimes referred to as surplus forage, has several times served well as emergency on the Jornada in years of short forage production. Stocking on such a basis results in good calf crops and low death losses. Furthermore, it permits the operation to run along on a more or less even keel, with a minimum of disturbance from the highly fluctuating forage production from year to year. As a result, production in terms of beef will be at a maximum and cost of running the herd will be kept down.

CONTROL WORM PARASITES

Two labor-saving methods of using the chemical, phenothiazine, to control injurious worm parasites of sheep are described in instructions issued by the Department of Agriculture. Investigations by government parasitologists have shown the practicability of mixing one part of the chemical with nine parts of salt and placing the mixture in open containers sheltered from the weather. The sheep are allowed to eat it at will. Adding a few handfuls of grain to the medicated mixture is helpful in getting sheep to eat it at first, after which they soon become accustomed to the taste.

The voluntary consumption of salt by sheep is normally greatest during the warm weather, which is also the time that risks from parasitism are greatest. Thus, the increased intake of the medicated salt is approximately in proportion to the dosage sheep need.

Another method of administering the drug is in feed. For a mature sheep the dose is about an ounce of phenothiazine to a pound of moistened grain. The animals can be readily treated in groups of about 10 at one feed trough.

Although announcing these practical labor-saving methods of administering the drug, department specialists emphasize the importance of hygienic management of the animals to keep them from becoming infested with worms. Resting and rotation of pastures are especially helpful in protecting sheep against infection by these parasites of which the most troublesome are nodular worms, stomach worms, and trichostrogyles.

'CATTLEMAN' EDITOR RESIGNS

Tad Moses, for many years editor of the *Cattleman*, official organ of the Texas and Southwestern Cattle Raisers' Association, published at Fort Worth, Texas, recently resigned to take the position of assistant director of information and publications at the A. and M. College of Texas.

REMEDY FOR MEAT CHAOS

CONFERENCES THAT SO FAR have had the effect of staying the ceilings on live animals that several times seemed imminent continued during the past month. What took place at these meetings is reported, as of April 11, by Frank S. Boice, Sonoita, Ariz., president of the American National Live Stock Association, in a statement to the western cattle producers whom he represented:

"You will remember that following the meeting of our joint livestock committee with Prentiss Brown, at which meeting he told us that he would not press for livestock ceilings until rationing and licensing had been given a fair trial, we met with the steering committee of the American Meat Institute and discussed with them their proposed plan for solving the war-time problem in meat.

"Following that meeting the American Meat Institute called a producer meeting for Chicago on April 2-3, and, in order that producers would not go into that meeting without a background of what had been going on, a meeting of the full joint livestock committee was called for April 1 in Chicago. There was good representation at this meeting, and there was a full discussion throughout the day of the plan which our joint livestock committee has been urging upon the Office of Price Administration (i.e., dollar-and-cents ceilings on meat at retail, licensing of slaughterers, a set-aside order for government requirements, and rationing to civilians) and the Institute plan. No conclusions were reached, as we wanted to give the Institute representatives a chance to present the plan the next morning.

"The meeting was held with the Institute on the 2nd. There was an excellent attendance of representatives of producer organizations—cattle, sheep and hogs—from all sections of the country, and the Institute plan, as presented, was discussed very fully.

"At the close of this meeting with the Institute the producers agreed to meet as a producer group to discuss what action, if any, would be taken. That meeting was held Friday night and it was discovered that there were some 93 producer, feeder, and marketing organizations represented. After full discussion, a resolution endorsing the meat-management part of the plan and stating our opposition to live-hog ceilings was unanimously adopted.

"At the general session next morning with the Institute group, this resolution was presented and the Institute group agreed that it would go along with us in an attempt to put the meat-management plan into operation, without reference to the imposition of hog ceilings during the time that it would be required to make the meat-management plan become effective.

"Saturday afternoon a meeting of the steering committee of the Institute and the joint livestock committee was held to map plans for future action. The meat-management plan was modified, in conformity with the resolution adopted by the joint livestock committee, and issued as a livestock and meat industry program.

"On April 5, representatives of the producer and the Institute groups met with Chester Davis, new food administrator, to discuss the meat-management plan. We found no resistance to the plan but a very great interest in the possibilities of using it. Mr. Davis at that time stated that in view of the existing situation there was no possibility of a revision upward in retail meat ceilings, and he wanted to know the attitude of the cattle interests in view of this situation. In my statement to him, as a representative of the cattle interests, I said that we were fully cognizant of the acute situation and were willing to accept whatever rollback was necessary in order to establish normal competitive margins for slaughterers and feeders, and thereby contribute to the efficient operation of the livestock and meat industry. It appears to us that the only thing that will bring about a raise in retail ceilings is a breakdown of production, and only time can determine that.

"In a subsequent conference with Mr. Davis he stated definitely that he did not favor ceilings on livestock but that livestock prices must be reduced, and that if these livestock prices could not be reduced by other methods we would have to have livestock ceilings. He confirmed this statement to us later in the week in testimony before the Small Business Committee of the House. At this Small Business Committee hearing, Prentiss Brown made the statement that under present conditions he was not pressing for the immediate imposition of livestock ceilings. These statements have been further confirmed by a release from the Office of War Information (referred to later)."

The Packers' Program

At the April 1-2 meeting in Chicago, the livestock interests accepted the packers' program, which was changed from the original plan as published in full in last month's PRODUCER only in respect to the suggestion that ceilings be set on hogs. The group unanimously adopted the following resolution:

"WHEREAS, We recognize that many features of the 'Meat Industry Program for Solving Wartime Meat Problems' as submitted to us today by the American Meat Institute are similar to the program already submitted by our group to the proper officials in Washington, and which are now partially in effect, and which tend in some particulars to