

Oregon Agricultural College Experiment Station

Cost of Producing Beef on the Ranges of Eastern Oregon

By

E. L. POTTER



CORVALLIS, OREGON

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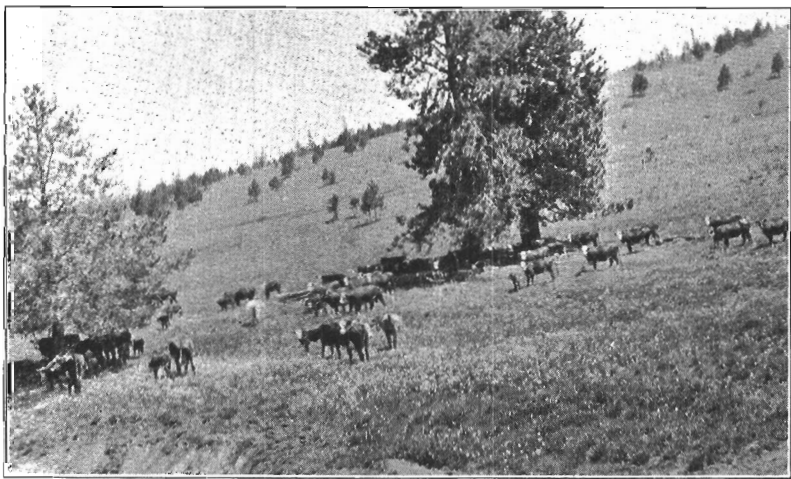


Fig. 1. Beef cattle on range in Eastern Oregon.

SUMMARY

Cost of grass steers per 100 pounds, live weight, farm price	\$ 9.75
Cost of winter fed steers per 100 pounds, live weight, farm price	11.50
Cost of beef cows per 100 pounds, live weight, farm price	8.00
Cost of weanling calves per 100 pounds, live weight, farm price	9.27
Cost of yearlings per 100 pounds, live weight, farm price	8.70
Cost of running a breeding cow a year.....	27.10
Cost of running a mixed herd a year.....	21.40

Cost of Producing Beef on the Ranges of Eastern Oregon

By

E. L. POTTER

Interest in the cost of producing beef lies primarily in a desire to forecast the future rather than in mere curiosity in what is past and gone. The studies and investigations which have led to the publication of this bulletin have, therefore, been directed more toward the fundamental economics of beef production than to mere bookkeeping. The particular aim has been to determine the factors which enter into the cost of beef production; that is, the amounts and kinds of feed, labor, grass, taxes, etc., necessary to the production of 100 pounds of beef. Once we have a knowledge of these facts, we then need only a list of current market prices to enable us quickly to determine the final cost of producing 100 pounds of beef in any given instance.

These cost studies may also bring out the financial importance of certain management practices that might well be improved. Lastly, this bulletin attempts to present a fair picture of the financial side of the beef cattle industry.

This bulletin is based partly upon surveys of the cattle industry in Oregon made at various times during the past ten years, and also upon a long series of experiments in growing cattle under range conditions conducted at the Eastern Oregon Branch Experiment Station. The first report on this work was made to the Oregon Cattle and Horse Raisers' Association at their annual meeting in La Grande in 1917. Since that time, however, the work has been checked and rechecked and hundreds of additional cattlemen interviewed. It is believed that the figures as they now stand are reasonably accurate.

The Blue Mountain section. Since beef cattle are produced under a great variety of conditions, an attempt to discuss all of them at once would lead only to confusion. Hence various sections of the state are discussed one at a time, beginning with that part of Oregon generally known as the Blue Mountain section, including not merely the Blue Mountains themselves, but the adjacent hills and valleys. The region along the eastern slope of the Cascade Mountains and also considerable portions of Jackson county have conditions so similar that they could well be included in the same category. The discussion of the Blue Mountain section, therefore, includes all of Eastern Oregon except the free range areas of Malheur, Harney, Lake, and Crook counties, in which conditions are so different as to require separate discussion. The Blue Mountain section is a country of the small cattleman. Most of the bunches run from 100 to 200 head. There are no outfits with more than 2,000 head and very few with more than 500. Both the ranges and the home ranches are for the most part too small to support large outfits. Much of the country is rough, and many ranches will have a difference in elevation of 500 to 2,000 feet between the highest and lowest points.

The typical system of handling is about as follows: The cattle are wintered on the home ranch, where they may get a little grass, but for at least four months, hay is the chief feed. In the spring the cattle are run out on the foot-hills and sage-brush lands adjoining the valleys, where they stay for one or two months. These foot-hill and sage-brush pastures are nearly all under fence and ordinarily form a part of the home ranch. For four to six months during the summer the cattle are on the mountains, either on the National Forest or on land leased from the timber companies. A few cattle may be kept on the foot-hill and sage-brush ranges throughout the summer, but this is not the general practice. In the fall the cattle are kept from one to two months either

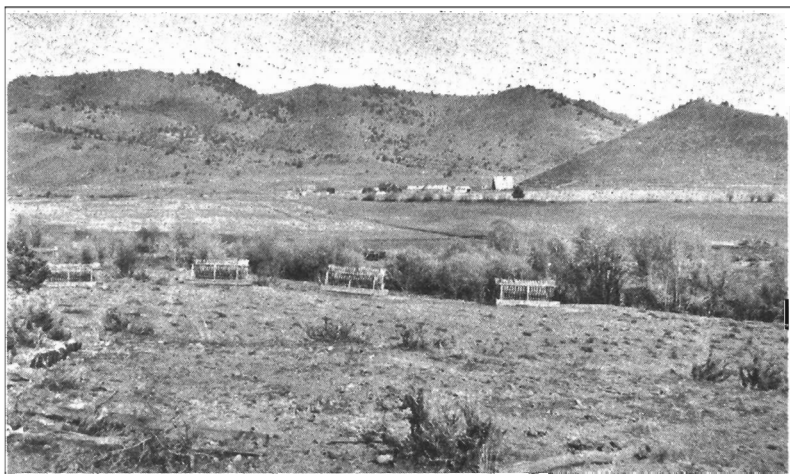


Fig. 2. A typical Blue Mountain ranch. Feed racks, alfalfa, and spring range.

on the foot-hills and sage-brush land which they occupied in the spring, or on the meadows which produced a crop of hay during the summer. This completes the yearly cycle.

Since most of the cattle trading is done in the fall, the cost figures have used that as a starting point in determining interest charges and inventories. Most of the spring calves are weaned in the fall, and it is not generally customary to count the calves in the inventory until after they are weaned; also most of the steers are sold at this season. Consequently, the fall makes a convenient beginning and ending point for the fiscal year.

Costs are of two kinds: First, operating expenses, such as labor, equipment, taxes, water-rights, fence repair, farm grazing fees, and salt. Second, investment expenses, including interest on both the investment in cattle and the investment in grazing-land. These two classes of expenses are separated because the first class is always a cost and one which must be met in all cases, while the second class represents a return on the investment rather than a true cost. Also the value of this investment is commonly obtained by capitalizing the income. Hence

there is an inevitable tendency to mark up the value of the investment when cattle prices are good.

In this territory, most of the cattle are kept on the same ranch from birth until ready for market. Since cows, calves, yearlings, and two-year-olds are all run together as one herd, it is much simpler not to separate the cattle of different ages, but to consider the breeding herd as a whole, starting with the fall count. In making the inventory the spring calves only, are counted, and not the two-year-old steers and surplus dry cows, which are either already sold or ready for sale. Under these conditions the typical expense bill would be as follows:

COST OF RUNNING A MIXED HERD IN THE BLUE MOUNTAIN COUNTRY

October to October

Running Expenses	
Hay for winter, 1 ton at \$8.00.....	\$ 8.00
Cost of feeding hay, at \$1.00 per ton.....	1.00
Bull costs .....	.65
Salt .....	.25
Riding and putting out salt.....	1.50
Taxes on cattle at 86c per head.....	.86
Taxes on 8 acres grazing-land at 11c per acre.....	.88
Forest grazing fees, 5½ months at 12c.....	.66
Total running expenses.....	\$13.80
Investment Expenses	
Interest on cattle, 8% of \$60.00.....	\$ 4.80
Interest on 8 acres of land at \$7.00 an acre at 5%.....	2.80
Total investment expenses.....	7.60
Total all expenses	\$21.40

Having presented the expense bill as a whole, the next step is to analyze the various items and see how they are determined.

Hay. The amount of hay for wintering is commonly estimated at 1 ton per head for mixed bunches. In some of the higher valleys that have rather long winters, such as those near Baker, Union, or Enterprise, the tendency is to feed more hay than this, probably averaging 1½ tons. On the other hand, in the districts of lower altitudes and better spring and fall ranges, the amount of hay may be less than 1 ton. Throughout much of the Blue Mountain country, however, particularly Grant county and Wheeler county and some of the adjacent territories, there is scarcely enough hay raised to allow 1 ton per head for the beef cattle, after taking care of the other livestock.

The hay situation in Eastern Oregon is illustrated by the accompanying table which shows the hay in the country available for cattle in normal years after allowance has been made for horses, sheep, and dairy cattle. In this it will be noted that the counties producing much more than one ton of hay per head have a surplus which may be shipped to market, used for winter fattening, or perhaps used for wintering stock brought in from other counties. Each county of Eastern Oregon ordinarily feeds its own stock except that Morrow county winters a good many in Umatilla county and Harney sometimes winters a few in Malheur.

County	Tons of hay per head of cattle	Remarks
Baker	1.34	Exports hay
Crook .....	.96	
Deschutes	1.54	Exports hay
Gilliam .....	.54	Feeds some straw
Grant .....	.62	Some winter range
Harney .....	.87	Some winter range
Jackson	1.09	
Jefferson .....	.72	
Klamath	1.27	Some fattening
Lake	1.45	Some fattening
Malheur	1.23	Exports hay
Morrow .....	.53	See Umatilla county
Sherman .....	.55	Feeds some straw
Umatilla	1.33	Exports hay
Union	1.53	Exports hay
Wallowa .....	.74	Short of hay
Wasco .....	.68	Some straw
Wheeler .....	.67	Some winter range
Total for Eastern Oregon.....	.99	

The cost of hay is figured at \$8.00 a ton, which seems to be a fair price for the beef-producing districts. A price of less than \$8.00 a ton has the effect of discouraging production and reducing the acreage of alfalfa, while a price much more than this figure has the contrary effect. We have made no complete survey of costs of hay production throughout the beef-producing sections, but upon the basis of such surveys as have been made and upon the work of the Union Experiment Station, the itemized cost of one ton of alfalfa would be as follows:

Irrigation	\$2.50
Harvesting	2.25
Cultivating and occasional reseeding.....	.50
Taxes on land .....	.65
Interest on land at 5%.....	2.00
Total per ton	\$7.90

There are, of course, certain districts with very high water charges that cannot meet this price. There are also other districts, close to a railroad, that can obtain a better price by shipping their hay to Portland. These districts, however, are outside of the cattle country and are not really factors in beef production.

Feeding hay. On account of the fact that labor in the winter is not well employed and that there is no demand for horse labor, it is customary to allow a much lower price for the use of a man and team than at other seasons of the year. We, therefore, find it common among cattlemen to estimate the value of a man and team during the winter at \$3.00 per day, whereas in the summer it would probably be nearly twice that. Another factor is that the team does not work very hard and is fed almost exclusively on hay. Most of the stock cattle are fed on the meadows or pastures very close to the stack yards, and are fed on the ground rather than in racks. In this way one man and team can feed 300 to 400 head of cattle or about 3 tons of hay per day. From this we derive the customary figure of \$1.00 per ton for the labor of feeding hay to stock cattle. This is also the most common price where the feeding is let by contract.

Bull charges. The laws of Oregon require, on the public ranges, one bull to each 25 cows. The actual practice is a few less than this

although some of the best cattlemen use one to 20. In a small, fenced pasture one to 40 or 50 is enough. With good management the average period of usefulness of a bull is four years, after which time he will have to be sold for beef. Assuming that he would bring for beef about \$60, the following table will show the approximate cost of maintaining a bull under various conditions.

Cost of the bull.....	\$100.00	\$200.00	\$300.00	\$400.00	\$500.00
Depreciation	10.00	35.00	60.00	85.00	110.00
Average valuation during period of use	(85.00)	(147.50)	(210.00)	(272.50)	(335.00)
Interest at 8% and insurance at 5% on average valuation	11.05	-9.17	27.30	35.43	43.55
Running expenses and range as other cattle	15.95	15.95	15.95	15.95	15.95
Total yearly cost	37.00	70.12	103.25	136.38	169.50
Cost per cow 1/50 .....	.74	1.40	2.06	2.73	3.39
Cost per cow 1/40 .....	.93	1.75	2.58	3.41	4.24
Cost per cow 1/25	1.48	2.80	4.13	5.46	6.78

The annual cost for one \$100 bull per cow would be \$1.48 per cow, or if charged to the entire herd, would be 44 percent of this figure or 65c per head, since a mixed herd carrying the steers to two-year-olds will run about 44 percent cows.

Salt. The actual salt required by cattle will range from $\frac{3}{4}$ pound a month on dry feed to 2 pounds a month when on very green feed. If there is much waste the amount allowed should be increased enough to cover this; generally speaking, 16 to 20 pounds per annum will be sufficient. The cost probably will be less than 1 cent per pound in quantities at railroad points, but in smaller quantities at the ranch the cost will be $1\frac{1}{4}$ to $1\frac{1}{2}$ cents per pound. The cattlemen generally estimate the cost of salt at approximately 25 cents per head per annum, which would seem to be a fair price, excluding the cost of putting the salt out on the range, which may be considered as a riding charge.

Riding. The expenses of riding are perhaps the most variable and the most difficult to estimate of all expenses connected with the cattle business, but fortunately the total of the item is not large. Where cattle are run together cooperatively and on the National Forest, riders are commonly hired by the association and the expenses prorated according to the number of cattle handled. We have the data for a large number of associations handled in this way and the average of all of these is 30 cents for the summer season of $5\frac{1}{2}$ to 6 months. Sometimes the expense for the summer season is as little as ten cents and in other cases as high as eighty cents. The difference comes in the number of cattle handled and in the amount of riding done. Frequently the cattle are turned loose and no attention is given them other than rounding up and salting. Riding after the cattle while they are on the summer range is the smaller part of it since in addition to the expenses incurred through the association there is the necessary riding in rounding up and moving the cattle to and from the different ranges. This will involve much labor for a few days and then it is over for several months. The cost, of course, depends largely upon the distance traveled and the attention given. Generally speaking, however, cattle that are close at hand and easy to see are given very much more attention so that the riding cost will not be much lessened; but, of course, the greater attention produces the greater returns. While the cattle are on the home ranch the work of looking after them will be small, but the fences must be kept

in repair, which is an added expense. Averaging figures from all sources, an annual charge of \$1.50 for all riding, handling, and putting out of salt seems to be a fair and reasonable figure.

Taxes. Taxes on cattle are always an important item of expense, but one which varies with every locality. The rate of assessment is left to the judgment of the assessor, with the result that there is no uniformity in the practice of the different counties. Not only do assessments vary, but the levy may be two or three times as high in one locality as in another. Unfortunately a high assessment does not always go with a low levy, with the result that taxes on cattle in some counties are four to five times what they are in other counties. The variation between various localities and school districts is even greater. A careful study of taxes on cattle, made by the writer for the Oregon Cattle and Horse Raisers' Association, showed that in 1922 the average tax on cattle amounted to approximately 86 cents per head for all of Eastern Oregon. This will include taxes on miscellaneous equipment as well as cattle, but will not include taxes on grazing-land or hay land. This same investigation showed that the average tax on grazing-land in Eastern Oregon was 11 cents per acre and that there were approximately eight acres of taxable grazing-land per head of cattle, thus making the taxes on grazing-land 88 cents for each head of cattle. The valuation of \$8.00 per ton on hay as previously given is supposed to cover all items of cost, labor, interest on land, taxes on land, etc. As a rule, however, the taxes on land enough to produce one ton of hay will run from 50 to 75 cents, with an average of 65 cents. The total taxes of all kinds relating to beef production would therefore total about \$2.40 a head. Since the average turnover is a little under 24 percent, the total taxes paid by the cattle business of Oregon averages \$10.00 for each beef animal marketed.

For further details of this tax question, the reader is referred to the annual report of the Oregon Cattle and Horse Raisers' Association for 1923.

Summer grazing. Much of the summer grazing in the Blue Mountain country is on the National Forest where, at the present time, the annual charge is running approximately 12 cents per head per month, and the average length of grazing season is $5\frac{1}{2}$ months, giving an average cost of 66 cents per head.

Spring and fall grazing. The stockmen in the Blue Mountain district own a large area of foot-hill or sage-brush grazing-land for spring and fall use. The census figures for Grant and Wheeler counties indicate an average of ten acres of deeded pasture land for every head of cattle and this corresponds rather closely to surveys made through that country. It must be borne in mind, however, that not all of the cattle or sheep are taken into the National Forest or other mountain pasture. This foot-hill land, therefore, maintains some stock throughout the season. In addition to the deeded land there are small tracts of government land open to homestead, but this land is isolated, generally rocky rims, or other land of very little value and used mostly by sheepmen, since they can use these isolated, unfenced tracts where the cattlemen cannot. This land is not much of a factor in the cattle business and the bulk of the spring and fall grazing must be obtained from the deeded land. For cattle that go into the National Forest or mountain pasture 8 acres

of deeded foot-hill land is enough, while the cattle that are kept on such land throughout the season need 15 to 20 acres.

Grazing-land has fluctuated greatly in value. The first grazing-lands homesteaded usually controlled a certain amount of water and consequently sold for a higher price than the grass on them would justify. Other homesteads were bought out because they were in the way. Finally, when the entire country was taken up, it was found that many tracts that were supposed to control other land no longer exercised such control and must be valued on the basis of what they would produce. A few years ago good foot-hill grazing-land was commonly priced at \$10.00 an acre, and if especially well located, as high as \$12 or \$15 an acre. Since the depression in cattle prices, the price of land has been going down, although not many sales are made. It is possible at the present time by looking around carefully to purchase very good land for grazing purposes at \$6.00 to \$8.00 an acre. We do not assume, however, to say that this is the correct or proper value of this land. Most operators have this much or more actually invested. On the other hand, cattle grazing produces no net income at present cattle prices. Our cost records show that the operating costs equal or exceed the returns from the cattle, leaving no margin as income from the grazing-land. Likewise, we know that there are thousands of acres leased for the taxes at from ten to twelve cents an acre. Any market value which this land has at the present time (October, 1925) is, therefore, based upon the hope of the future, and not upon present known facts. If cattle prices should advance to the same level with the other commodities—in other words if steers should sell at approximately ten cents a pound on the farm—the valuation of \$6.00 to \$8.00 an acre would be justifiable. In the long run, the value of grazing-land must depend upon the returns which can be obtained from it, and since the running expenses do not correspond particularly with the price of cattle, the margin left as income on the investment must fluctuate even more than the price of stock. The value of deeded grass, moreover, depends to a considerable extent on its accessibility to National Forests or other cheaper grazing. A loss of free grazing privileges or an increase of grazing fees would depreciate the value of deeded land.

Interest rates on land of any kind can seldom if ever be high. When the productive value of land is once known, it will seldom pay a higher rate of interest than would good bonds, and the possibility of an increase in value will also be considered as a part of the income. We would, therefore, consider 5 percent as a fair interest on land.

Interest on investment in livestock. The capital value of the livestock investment is figured as nearly as possible at the cost of production, as this is the real investment. The cost of production, as we are well aware, is much above the present market prices and it would be possible for a beginner to buy stock cattle on the basis of current market prices at much less than the cost of production, but that would be merely passing a part of his individual loss back to the man who raised the cows, or to use the old expression, it would be "robbing Peter to pay Paul."

There is considerable variation in the interest rate, but we feel that 8 percent is about a proper allowance in the way of true interest. It is, of course, a fact that many of the banks charge 9 percent and 10 percent, and it is also a fact that the cattle loan companies charge 9 percent to

9½ percent or even 10 percent interest, but in such cases the lender lends a very large proportion of the value of the herd and is obliged to take so much risk that evidently a considerable portion of this interest is scarcely interest in the true sense of the word, but rather a part of the risk of the investment. We do not believe it reasonable to expect any industry to pay an interest rate in excess of 8 percent. It is unfortunately true, however, that the cattle and sheep industries are at the present time charged the highest rates of interest known in the commercial world. This is largely due to the fact that the loan companies have no way that is not both expensive and unreliable of inspecting the security. The loans are also often so large that when there is a depression the loan companies have to stand a large share of the losses. When times are prosperous, lending on livestock at 9 percent and 10 percent is very profitable; at other times it is disastrous.

Income. The income to be derived from a herd of cattle depends upon the calf crop, quality, weight, and market price of the animals sold, and the death losses. Each of these items is of sufficient importance to receive separate consideration.

Losses. The losses are irregular, varying much from year to year. They are also very difficult to ascertain since most cattlemen do not count their cattle with sufficient accuracy to be sure on this point. In bunches of a hundred or less one man may lose none, while another will lose ten to fifteen. In a survey made seven or eight years ago most of the cattlemen figured that 1 to 2 percent would easily cover all their losses on cows; 3 percent on calves; and 1 percent on older steers. A further study of this matter, however, indicates that the losses are unquestionably very much higher than this, and that 3 percent is about the lowest loss which we can ordinarily expect with cattle under range or semi-range conditions, and that the loss may increase from this on up, in some cases as high as 8 and 10 percent. The chief sources of loss are: (1) the loss of cows at calving time, particularly young heifers; (2) the loss of cattle from various poisonous plants; and (3) the loss from straying, particularly on the summer ranges. Another source of loss in some localities is blackleg among calves but vaccination and care will very largely prevent this loss. Aside from this, disease is not a serious factor in beef raising, as it is in other lines of livestock. In the case of steers past one year of age, the loss from disease is almost negligible.

A recent survey of losses in this district showed losses ranging from 2 percent to 10 percent with an average of about 4.3 percent. On the other hand, figures on losses supplied by the National Forest Service showed an average loss for the same district of 8 percent. The latter loss may be slightly exaggerated, but the figures given in our survey may be somewhat low, owing to the tendency of many stockmen to forget the full extent of their losses. The losses at the Eastern Oregon Experiment Station for steers wintered on hay and run on the National Forest in the summer, show an average loss of 3 percent, most of which has been due to straying or to bloat on alfalfa pasture in the fall. It is believed that under good management the annual losses can be cut down to 3 percent in all except unusually unfavorable conditions, and that the average loss at the present time is actually about 5 percent and perhaps higher, rather than lower than that figure.

Calf crop. The number of calves per 100 cows is the vital factor in the cattle business. Poorly managed herds under bad conditions are getting a calf crop of only 50 percent, while under the best conditions the average may be as high as 75 percent, even under strictly range conditions. Of course, even these figures will vary greatly in good and bad years. The average calf crop in Oregon is about 65 percent; that is, from 100 cows bred this year 65 calves may be weaned next year. This figure has been checked from many angles, and it is not far from the true average. This same figure will apply to all of the Rocky Mountain country. In the desert country the percentage is lower, and in Arizona and New Mexico it is apparently less than 50 percent on the average, varying from 20 to 65 percent according to the year. Cattle bred and handled in small pastures, on the other hand, will produce about 10 percent higher calf crop than range cattle.

PERCENT OF TURNOVER

By "percent of turnover" is meant the number of cattle that may be sold each year out of each 100 in the herd. This in turn depends upon the percentage of loss, the percentage of calves, and the age at which the steers are sold. It is determined as follows, where the annual loss is 5 percent, the percentage of calves 65 percent, and the steers sold as two-year-olds. For convenience, the figures are based on a herd in which 1000 cows are bred each year.

	Inventory, fall 1925	Losses during year at 5%	Inventory, fall 1926
Breeding cows	1000	50	950
1926 calf crop, steers } 65% at	.....	.....	325
1926 calf crop, heifers } weaning	.....	.....	325
1925 calf crop, steers	325	16	309
1925 calf crop, heifers	325	16	309
1924 calf crop, steers	309	15	294
1924 calf crop, heifers	309	15	294
Total inventory	2268	.....	.....

At the end of the year, the 294 two-year-old steers are sold or ready to sell. The 294 two-year-old heifers might be sold, but if the standard of the cows is to be kept up they should all be put into the breeding herd. These heifers, added to the 950 cows, will bring the cow herd up to 1244, but if 244 head of dry cows and inferior stock are taken out and sold, the breeding herd will be brought back to 1000 head. Out of a total of 2268 cattle, therefore, there can be sold each year (with a 5 percent death loss and a 65 percent calf crop), 294 head of two-year-old steers and 244 cows, or a total of 538 head, and yet keep up the herd. Thus each year are sold 538 out of 2268 or 23.7 percent of the herd. Therefore, the "turnover" in this case is 23.7 percent.

If the steers are not sold until they are three years old, the inventory would be increased by the number of two-year-olds carried over into the third year. The sales would be the same except for the death loss of carrying the steers another year. The situation would then be as follows:

SELLING THREE-YEAR-OLD STEERS

Inventory as above	2268
Three-year-old steers held over to sell as threes.....	294
Total inventory	2562
Three-year-old steers to sell (294 less 5 percent loss).....	279
Dry cows to sell	244
Total sales	523
Percent of turnover	20.4

Since it is something of a mathematical problem to figure out the percentage of turnover, the accompanying table is presented to show at once what the turnover will be under any given condition. This table will be found not only useful as reference, but worthy of study in showing the influence of death loss, calf crop, and age of selling on the turnover.

PERCENT OF TURNOVER

To find the number of cattle including both steers and dry cows that may be sold annually from a herd of 100 head, all ages, turn to the column showing your percent of death loss; follow down to the figure opposite your calf crop (at weaning) and that figure will be your answer. If the steers are to be sold at 2 to 2½ years of age use the first table. If the steers are sold at 3 to 3½ years of age use the second table.

Of the total number sold, slightly more than half (52 to 55 percent) will normally be steers and the remainder dry cows or heifers.

SELLING STEERS AS TWO-YEAR-OLDS IN NOVEMBER

Losses calf crop	2%	3%	4%	5%	6%	8%	10%
50%.....	23.3	22.2	21.3	20.3	19.4	17.5	15.5
55%.....	24.3	23.4	22.5	21.5	20.6	18.8	16.9
60%.....	25.4	24.5	23.6	22.6	21.7	19.9	18.0
65%.....	26.4	25.5	24.6	23.7	22.8	20.9	19.1
70%.....	27.5	26.4	25.5	24.6	23.7	21.9	20.0
75%.....	28.2	27.3	26.4	25.5	24.6	22.8	21.0
80%.....	29.0	28.0	27.2	26.3	25.4	23.6	21.8
85%.....	29.6	28.8	27.8	27.0	26.1	24.3	22.5
90%.....	30.3	29.5	28.5	27.7	26.8	25.0	23.2

SELLING STEERS AS THREE-YEAR-OLDS

50%.....	20.4	19.5	18.6	17.7	16.8	15.0	13.2
55%.....	21.4	20.5	19.6	18.7	17.8	16.0	14.2
60%.....	22.2	21.3	20.5	19.6	18.7	17.0	15.2
65%.....	23.0	22.1	21.3	20.4	19.5	17.8	16.0
70%.....	23.7	22.9	22.0	21.1	20.2	18.5	16.8
75%.....	24.4	23.5	22.6	21.8	20.9	19.2	17.5
80%.....	25.0	24.1	23.3	22.4	21.5	19.8	18.1
85%.....	25.5	24.7	23.8	22.9	22.1	20.4	18.7
90%.....	26.0	25.2	24.3	23.5	22.6	20.9	19.3

When the percent of turnover, together with the cost per head of running the herd is known, the total cost per animal sold can be readily determined; for example, as has been previously shown, the average annual cost per head is \$21.40 for each head of cattle in the herd. Through most of the Blue Mountain country the calf crop is about 65 percent and the death loss 5 percent. This would mean that, under these conditions, the turnover would be 23.7 percent, and the total cost, therefore, of each animal sold would be \$90.30 ($\$21.40 \div 23.7 = \90.30). This cost, of course, would apply to two-year-old steers and to dry cows. In this case the percentage of two-year-old steers would be about 55 percent, and the other 45 percent would be dry cows. There is, of course, not an

entirely satisfactory way of splitting up this cost between the steers and the cows. One could credit the herd with the selling price of the cows and then charge the steers with the remainder. This, however, is hardly fair, since it would be putting all the profit and loss on the steers, while in reality beef production is just about as much that of producing cows as it is producing steers, and it is not possible to produce one without the other.

The influence of a good calf crop and a low death rate is shown in the percent of turnover and from that in the cost of production. For example, with a 75 percent calf crop and a 3 percent death loss, the turnover is 27.3 percent, which would reduce the total cost per animal sold from \$90.40 to \$78.39. This high percentage of turnover is not an impossibility to the best of the Eastern Oregon cattlemen. On the other hand, there are many calf crops of only 50 percent and death losses running up to 8 percent. This would mean a turnover of only 17.5 percent and would increase the cost per animal sold to \$122.90.

COST OF MAINTAINING CATTLE OF DIFFERENT AGES

The preceding cost estimate is for a mixed herd containing the normal percentage of cows, calves, yearlings, etc., to sell steers as two-year-olds. The costs, however, might be separated so as to deal independently with cows, calves, and yearlings. The cost of running cattle of different ages is not far different except for the bull charges, which must be considered in connection with the cow herd. The interest charges are slightly less on running calves from weaning until 18 months of age, and the hay requirements are also less. This is why the steers of 18 months of age bring a lower price per pound than at other periods of their lives. It should be borne in mind, however, that only one-half the cattle are steers and that the other half are heifers. The cost of the heifers is the same but the selling price is often about \$1.00 to \$2.00 less. Usually heifers all go into the breeding herd and dry cows are sold in their place, but that does not change the situation.

In the Blue Mountain country, the tendency is to keep the cattle from birth to maturity on the same ranch and there is really no reason for doing otherwise. One part of the animal's life is about as profitable as another. The number of pounds of beef produced per annum is, under present conditions, about the same. In October, spring calves will weigh about 450 pounds, and at the rate of two calves for every three cows, this means 300 pounds of beef produced for each cow maintained. At 18 months of age this steer will have added 300 pounds and will weigh about 750 pounds, and at 30 months of age will have gained another 300 pounds and will weigh 1050 pounds. The heifers, however, will weigh considerably less than the steers. These figures are for cattle of good breeding, given about a ton of hay during the winter, and about all the grass and mountain range they can consume during the summer. Where the grazing is short at any season of the year, the gains will be less than have been indicated. The average steer in the Blue Mountain country does not weigh 1050 pounds at 30 months of age, probably lacking 50 to 75 pounds of this weight. Those which have received good care, however, will weigh 1050 pounds and yet keep the feed and expense bill within the budget indicated. These figures are therefore representative of good management—management which is a little better than the average but yet not ideal.

COST OF PRODUCING BEEF

COST OF MAINTAINING A COW

October to October

Losses on cows, 5% of \$75.00.....	\$3.75	
Hay for winter, 1 ton at \$8.00.....	8.00	
Cost of feeding hay at \$1.00 per ton.....	1.00	
Bull charges	1.48	
Salt .....	.25	
Riding and putting out salt.....	1.50	
Taxes on cattle at 86c per head .....	.86	
Taxes on 8 acres of grazing-land @ 11c per acre.....	.88	
Forest grazing fees, 5½ months @ 12c.....	.66	
Total running expenses		\$18.38
Interest on cows, 8% of \$75.00.....	\$6.00	
Interest on 8 acres of land @ \$7.00 an acre.....	2.80	
Total investment expenses		8.80
Total expenses of all kinds per cow.....		\$27.18
Total expenses of all kinds per calf @ 65%.....		\$41.82

COST OF MAINTAINING A CALF FROM 6 TO 18 MONTHS

Hay for winter, .9 ton at \$8.00.....	\$7.20	
Cost feeding hay at \$1.00 per ton.....	.90	
Salt .....	.25	
Riding and putting out salt.....	1.50	
Taxes on cattle at 86c per head.....	.86	
Taxes on 8 acres of grazing-land @ 11c per acre.....	.88	
Forest grazing fees, 5½ months @ 12c.....	.66	
Total running expenses		\$12.25
Interest, 8% of \$41.82	\$3.35	
Interest on 8 acres of land @ \$7 an acre @ 5%.....	2.80	
Total investment expenses		6.15
Total expenses of all kinds.....		\$18.40
Initial cost of calf		41.82
Total		\$60.22
Probable death loss of 5%.....		3.01
Total net cost at 18 months.....		\$63.23

COST OF MAINTAINING A STEER 18 TO 30 MONTHS

Hay for winter, 1.1 ton at \$8.00.....	\$8.80	
Cost of feeding hay at \$1.00 per ton.....	1.10	
Salt .....	.25	
Riding and putting out salt.....	1.50	
Taxes on cattle at 86c per head .....	.86	
Taxes on 8 acres of grazing-land @ 11c per acre.....	.88	
Forest grazing fees, 5½ months @ 12c.....	.66	
Total running expenses		\$14.05
Interest, 8% of \$63.21.....	\$5.06	
Interest on 8 acres of land @ \$7 per acre @ 5%.....	2.80	
Total investment expenses		7.86
Total expenses of all kinds.....		\$21.91
Initial cost of yearling	\$63.21	
Probable death loss of 5%.....	4.26	
Final cost at 30 months		\$89.38

SUMMARY

	Cost per head	Per cwt.
Cost of maintaining a cow one year.....	27.18	.....
Cost of calf at 6 months of age at 65% calf crop with estimated weight 450 lbs.	41.82	9.29
Total cost of steer or heifer at 18 months of age with estimated weight 725 lbs.	63.21	8.72
Total cost of steer or heifer at 30 months of age with estimated weight 1,000 lbs.	89.38	8.94

This method of determining the cost gives a final figure \$89.38 for a two-year-old as compared with \$90.40 by the other method of figuring. This is accounted for by slight differences in the way in which depreciation, death loss, and interest are handled. Since there seems to be no accurate method of calculating down to the last cent the cost of beef production, \$90.00 is given in the summary as the final cost of the two-year-old steer or heifer.

COST OF CATTLE RUN ENTIRELY ON FENCED DEEDED LAND

Some cattle in the Blue Mountain country are run entirely on deeded land. This requires from 15 to 30 acres for each head of cattle, depending on the kind of land. The average will be about 18 acres. The investment is higher in this case, but the losses are somewhat less and the calf crop higher. The quality of the feed is not usually any better than where the cattle go into the mountains, hence the weight and value of the cattle sold is about the same.

RUNNING EXPENSES

Hay for winter, 1 ton at \$8.00.....	\$8.00
Cost of feeding hay at \$1.00 per ton.....	1.00
Bull costs .....	.65
Salt .....	.25
Riding and putting out salt and miscellaneous.....	1.50
Taxes on cattle at 86c per head .....	.86
Taxes on 18 acres grazing-land at 11c per acre.....	1.98
Total running expenses	\$14.24

INVESTMENT EXPENSES

Interest on cattle, 8% of \$50.00.....	\$4.00
Interest on 18 acres of land @ \$7 an acre @ 5%.....	6.30
Total investment expenses	10.30
Total running expenses and investment expenses.....	\$24.54
Total per head of cattle sold at 25.5% turnover (4% loss and 70% calf crop, see page 14)	\$96.22

This statement indicates that cattle can not be raised entirely on deeded land at as low a cost as where they go onto the National Forest. The only way in which costs can be made comparable is by reducing the valuation of the deeded land that does not have forest grazing privileges.

There are not many herds handled under exactly the conditions budgeted above. Many users of the National Forest and other mountain grazing keep a part of their cattle on the home ranch. They often find that the home pastures will carry a few cattle through the summer, one head to 20 to 40 acres, for instance, without greatly lessening their carrying capacity during the spring and fall. Many also follow the practice of keeping their steers in fenced pastures and sending the cows to the mountains. In those cases the final cost is a joint cost lying somewhere between the costs given above and the figures given for cattle running on the National Forests.

LEASED LANDS

The above budgets have all been made on the assumption that the deeded land was the property of the cattleman. The fact is that about half of the deeded foot-hill and sage-brush land in the territory under

discussion belongs to other persons than ranchmen; that is, to homesteaders, land speculators large and small, road companies, banks, loan companies, etc. These lands are priced at prohibitive figures, presumably on hope, but in the meantime they are leased to the stockmen. The price of the lease at the present time seldom pays any interest on the investment; in fact, a very common price is the exact amount of the taxes. The cattleman who is using these lands is thereby able to pass a part of his loss on to the landowner. The loss is not lessened in any way by this process, but is merely divided up among more people. The owner of cattle-grazing land who leases his land to actual cattle operators is a party to the beef-producing business and entitled to a fair remuneration.



Fig. 3. Free range in southeastern Oregon.

COST OF BEEF PRODUCTION ON FREE RANGE

In the southeastern part of Oregon, there is an immense area of free range. This area includes most of Malheur and Harney counties, together with the eastern half of Lake county and the southeastern part of Crook county. The entire district covers from fifteen to sixteen million acres; however, there is within the area nearly two million acres of fenced grazing-land, hay land, and farm land, leaving approximately fourteen million acres of free range. Of this free range, eleven and one-half million acres is public domain and a little over one-half million acres is state land. The remainder is mostly deserted homesteads lying open without control and grazed by the stockmen in the same manner as the public domain.

Although designated as a free range country, the cattlemen all own or control some grazing-land and taxes and interest are figured in our estimates on four acres of such land, which seems to be about the average amount used by the cattlemen who depend primarily on the free range. The hay in this region is mostly wild hay and, on the average, is not as good as alfalfa, but the cost of production is less.

Necessarily the calf crop is lighter under these conditions. Also the cows and steers weigh less and are worth less per pound. The death losses, however, do not seem to be any heavier in the desert country of Oregon than in the mountains. Since the steers do not get large enough to market as two-year-olds, they commonly have to be held over until they are three-year-olds, hence the turnover is less.

An estimate of expenses and receipts follows:

COST OF RUNNING A MIXED HERD ON FREE RANGE

October to October	
Hay for winter, 1 ton at \$6.00 per ton.....	\$6.00
Cost of feeding hay at \$1.00 per ton.....	1.00
Bull costs .....	.65
Salt .....	.25
Riding and putting out salt.....	1.50
Taxes on cattle at 86c per head.....	.86
Taxes on 4 acres grazing-land at 11c per acre.....	.44
Total running expenses	\$10.82
Interest on cattle 8% of \$50.....	\$4.00
Interest on 4 acres land @ \$7.00 an acre @ 5%.....	1.40
Total investment expenses	5.40
Total all expenses	\$16.10

The expense bill in the free range country is quite low on the basis of the cost per head of the entire herd, but on the basis of the cattle sold, it is quite another matter. Since the calf crop is only 50 to 55 percent, and the steers are not beef until they are three years old, the turnover is low. With a 50 percent calf crop the turnover is 17.7 percent, which would make the cost per head sold \$90.96. Where the calf crop can be raised to 55 percent the cost per head sold would be \$86.10. The true figure is probably somewhere between these two; in other words, the final cost is not materially different from what it is in the regions without free range. There are, in fact, a great many cattlemen in the free range country who are using much more deeded land than the four acres indicated. This increases the cost of running the herd, but it also increases the turnover, so that the cost of 100 pounds of beef is not far different. This country is, on the whole, rather better for cows than for steers and some steers are sold as calves or yearlings rather than being kept to maturity; this, however, is not the general practice. On the whole, there is no evidence that the cattlemen in the free range country have any advantage over the cattlemen in the Blue Mountain country, where the range is practically all under some form of control.

COST OF WINTER BEEF

All of the previous figures have been for grass-fat beef marketed in the late summer or fall from grass. Where cattle are held into the winter after the grass season, the cost increases, since the gains that are made on hay are not sufficient to pay for the costs. With good alfalfa

at \$8.00 a ton, it is safe to figure that the cost of cattle fed on hay will increase at the rate of 35 cents per hundredweight for each month they are on feed. Cattle, for example, that have accumulated a cost bill of \$9.00 per hundredweight at the end of a grass season will, at the end of four months' hay feeding, reach the total cost of \$10.40. The increased cost per hundredweight is practically the same whether the cattle are fed merely hay enough to hold their own, or whether they are given all they will eat, but of course, those which are given all they will eat will improve slightly in condition so that the chances of getting this increased cost out of them will be better than in the case of those that have been merely roughed through.

The figure of 35 cents a month given above is based upon several years of experimental work both in wintering cattle and in fattening steers at the Eastern Oregon Branch Experiment Station. The data on these experiments are given in Oregon Experiment Station Bulletin 182, Growing Steers, and in Oregon Experiment Station Bulletin 198, Fattening Steers for Market.

REDUCING COSTS

In studying the costs of producing beef, the chief concern is where and how these costs may, if possible, be reduced. In the first place, it should be understood that the costs given in this bulletin are based upon reasonably good management and intelligent business methods. There are cattlemen in Oregon who are negligent in the care of their stock and slipshod in their business methods. Their death losses are heavy, their calf crop is low, and their marketable stuff is small and inferior. These cases of manifestly poor management, however, have been eliminated from the averages given in this bulletin. Their figures are, of course, very much higher than those which we have given. In addition to poor management, there are a good many cattlemen in the state whose financial position is such that they cannot possibly handle their business in the way their judgment dictates. Their management is bad and their interest rates excessive. Their costs likewise reach exorbitant figures and have not been included. The actual cost of production on the ranges, therefore, is more apt to run over rather than under those which are given herein. It is, however, possible in some cases to produce cattle at a somewhat less cost than has been indicated. Generally speaking, under Blue Mountain conditions, a calf crop of approximately 75 percent and a death loss of only 3 percent is a possibility; it is also possible, by good management of the grass (and not by excessive use of winter feed), to add 50 pounds or more to the weight of the cattle. The man who can do this, however, is an exceptional man and can command a substantial reward for his services wherever he goes. Adverse prices have tended to drive these good men out of the business, or to prevent them from entering in the first place. While the exceptional man may keep his costs below the figures given, it would be unfair to the rank and file of cattlemen to say they are bad managers because they have been unable to do so. On the whole they will do well to keep their costs as low as those given in this bulletin. In order to do this they will have to tend strictly to business and make very few mistakes. The depression in prices has also had its influence on costs. The first effect was to reduce costs by causing the cattlemen to eliminate every possible unnecessary expense and also to mark down any excess valuation which

they had on their investment. The continuation of the depression, however, has tended to increase costs, not by increasing the operating expenses, but by lessening the turnover. Cattlemen have been financially unable to buy good bulls or even enough bulls of any kind. They have often been unable to buy feed or to put enough labor on the cattle to care for them properly. Consequently, the tendency has been for the calf crop to decrease, the death losses to increase, and the general quality of the cattle to deteriorate.

SUMMARY OF THE SITUATION

The most conservative cost that can be put on beef production and allow interest on a reasonable investment, is \$90.00 per head or \$9.00 per hundredweight for two-year-old steers and dry cows mixed. Since the usual spread between steers and cows is about \$1.75 per hundredweight, and since the sale cattle run about 55 percent two-year-old steers and 45 percent cows, a fair division of the cost places the cost of the steers at \$9.75 per hundredweight and the cows at \$8.00 per hundredweight. This is for grass cattle during the summer and fall, and is f.o.b. the ranch. The cost delivered in Portland would average \$1.00 per hundredweight more. Steers produced for the winter market would likewise cost 35 cents per hundredweight more for each month they were held after the grass season. The whole situation may be summarized as follows:

TWO-YEAR-OLD GRASS-FED STEERS

	Per cwt. farm price
Cost of production	\$9.75
Average selling price, 1922, 1923, 1924	6.25
Loss	3.50
Average selling price, 1925	7.00
Loss	2.75

It might be assumed that in the above costs of production, interest was charged on an inflated value of grazing-lands. When all interest charges on grazing-lands are eliminated, however, the cost of producing grass-fed two-year-old steers was found to be \$8.60 per hundredweight, and if interest is eliminated on grazing-lands and also on the entire livestock investment, which, of course, is a financial impossibility, the cost would be reduced to \$6.50.

In the case of winter-fed steers, both the cost and the selling price are higher as indicated below:

WINTER-FED STEERS FOR APRIL DELIVERY

	Per cwt. farm price
Cost of production	\$11.50
Average selling price, 1922, 1923, 1924	7.00
Average selling price, 1925	8.50

The above cost of production covers the entire cost from birth to maturity. Often the winter feeders have been able to turn out steers for \$11.50 but only because they have bought their feeders for less than the cost of production and thereby passed some of the loss back to the

grower. Here, again, if the interest charges on grazing-land are eliminated, the cost will be reduced to \$10.35 and if the interest is eliminated on both cattle and grass, the charges are reduced to \$7.75.

During the past four years, there have been numerous arguments as to whether the price of cattle was sufficient to pay operating costs without interest of any kind. In other words, whether a cattleman who owned his cattle and land free of debt could keep even. The general consensus of opinion has been that he could not, but some few cattlemen claim that they can keep even under these conditions. The cost figures indicated above show that up until the current year the average selling price of steers has been less than the bare operating expenses, excluding interest of all kinds. During 1925, the price has improved somewhat and the producers are now getting slightly more than operating expenses, but not enough to cover interest on their necessary livestock investment, to say nothing of interest on land.

There seems to be a suspicion in the minds of many people not engaged in the cattle business that the present financial condition of the cattle business is due at least in part to excessive costs of production rather than to market prices, and admitting that cattle prices are low, they feel that even a fair price would not save the situation. The answer to this is found in the following facts: The average price of good grass steers f.o.b. the ranch in 1913 was \$6.00 per hundredweight. According to the index figure put out by the United States Bureau of Labor, the average wholesale price of all commodities in August, 1925, was 160 percent of the 1913 price. If the price of cattle had increased in this same ratio, steers would be selling now (September 1, 1925) at \$9.60 and good cows at \$8.30 farm prices. These prices would pay the cattlemen operating charges and a reasonable interest on investment. Oregon Experiment Station Bulletin 219, *The Cost of Producing Mutton and Wool on the Ranges of Eastern Oregon*, shows that the cost of producing lambs on the ranges of Eastern Oregon is at the present time \$10.00 per hundred-weight, farm price, for fall delivery, even after we have credited the sheep with 40 cents per pound for the wool. This shows again that the cost of production of cattle is not excessive and that the cattlemen are producing meat more cheaply than the sheepmen have been able to do. All of these facts together demonstrate that the present situation in the cattle business is not due to an abnormal cost of production, but to a subnormal price of the finished product.