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Cattle costs

E. D. Newman

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130 WEST 42ND STREET, NEW YORK CITY

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APRIL, 1921

CATTLE COSTS

The purpose of this publication is to indicate sound cost principles upon which reliable data may be compiled which may be used in the determination of a fair selling price.

There is practically no published material dealing with live stock accounting. Very little reliable information on live stock production costs has been published. A Government publication which covers operations for the year 1914, as compared with previous years, is considered by practical cattlemen as almost worthless for present day purposes.*

That there are misunderstandings on the part of almost every one connected with the live stock industry, is apparent to all. Differences of opinion exist as to the cost of cattle produced on the range, between the feeders who purchase western cattle and finish them for the market, the general public, and the cattle raiser, himself. The cattle raiser is inclined to believe that it is impossible to obtain reliable cattle costs. He is led to believe that the very nature of the industry precludes the securing of sound costs.

As a matter of fact, those who have made a careful study of the business side of cattle raising know that sound costs may be obtained through the application of the same general accounting principles as are used in the determination of manufacturing costs in other lines of commerce or industry. While it is true that the live stock industry has its own peculiar problems, these problems are not more intricate than those which are encountered in many other industries. The accounting methods which are followed in determining the cost of producing a calf are no more intricate and not essentially different from those employed in securing similar information in regard to a plow or a locomotive.

It will be necessary to limit this article to a consideration of cost principles based on existing conditions which may be used

*The reference is to a report (No. 110) issued by the United States Department of Agriculture. It deals with eleven far western range states and is based on reports from stockmen and county correspondents for the year 1914.

as a basis for the compilation of production costs which will indicate clearly and quickly whether the business is being operated at a profit or a loss. The writer would make a distinction between sound cattle costs, the term being used in the sense of actual unit costs and cost analysis the object of which is to use the cost figures as a basis for the betterment of existing conditions—better breeding herds, better management, the decrease of accident losses occasioned by predatory animals and poisonous plants; the lessening of death losses due to poverty (insufficient range and feed) and old age, by cutting out from the breeding herd the old animals which have served their usefulness and should be turned into cash at "scrap" value as "canners" before they are allowed to perish, and the many other problems related to the intricate business of cattle raising.

Calf Production Costs

The factors which must be considered in determining the cost of breeding calves and raising them to the age of six months on a western cattle range are:

1. Range
2. Breeding herd
3. Equipment
4. Operating expense
   (a) Feed and salt
   (b) Labor
   (c) Repairs
   (d) Taxes
   (e) Miscellaneous
5. Death and accident loss (breeding herd)
6. Depreciation
   (a) Breeding herd
   (b) Equipment
   (c) Improvements
7. Working funds
8. Percentage of increase

These points will be considered separately.

1. THE RANGE. For the breeding herd the range is provided either in the form of privately owned land, free or partly free from incumbrance; leased privately owned land; leased State or Public Domain land or Forest Reserve land.

An adequate number of acres based upon what is termed the carrying capacity of the range must be provided for the

maintenance of the breeding herd, up to and including the period of weaning the calf, usually after it is six months old, and in addition sufficient acreage to provide pasture for saddle horses and work stock. From experience it has been established that the minimum allowance is about twenty-five acres per cow. This number of acres per year per cow, if maintained, will insure against deterioration of the land, caused by over-grazing during drouth periods, stamping out the grass roots due to overstocking, provide sufficient winter feed in case of killing frosts before the grass has cured, and at the same time will make natural reseeding possible.

An improved ranch will be fenced and cross fenced into suitable pastures, water developed, and provided with adequate ranch buildings. The cost of buildings, fences and improvements are usually included in the cost price per acre where land is privately owned. On leased privately owned land the charge for depreciation of buildings and improvements is a factor which must be considered in the rental price. On leased state or public domain land the charges are based upon so much per head or so much per acre.

The open range—free range—will in time entirely disappear, if it has not already done so. As time goes on, greater investments in land and improvements will be mandatory as an insurance against losses. A modern ranch outfit cannot take the chance of losing breeding animals because of inadequate shelter during severe winters. The cost of breeding herds today is many times higher than in the days of long-horns and scrubs.

In figuring production costs it is common practice to include the charges to cover lease rentals, borrowings in whole or in part for land purchases, or interest on investment in land, free or partly free from incumbrance, under a caption "Use of Land." As these charges are deductions from profits rather than additions to costs they should be treated in that way in arriving at a basis for the selling price.

2. THE BREEDING HERD. The breeding herd of today, as a result of the purchase of well-bred stock or the infusion of new well-bred blood, compares very favorably with the stock owned by our Middle West or Eastern cattle growers. The investment in one of the large well-bred or pure bred western herds would astound the "tender-foot." The supply of cows and bulls necessary to stock the range according to its carrying capacity requires owned capital or borrowed money. The current rate of interest on borrowings is rarely less than ten per cent. This charge—interest on borrowings or interest on investment in whole or in part, as the case may be—is also frequently included in what is commonly known as production costs. As these charges also are deductions from profits rather than additions to costs,

they should be treated in the same manner as interest on borrowings for land purchased, as explained above.

3. EQUIPMENT. Ranch equipment consisting of saddle horses, work horses or mules, wagons, harness, small tools, etc., also requires an outlay of owned capital or borrowed money. As in the cases heretofore mentioned, the charge—interest on borrowings or interest on investment—also should be treated as a deduction from profits rather than as an addition to costs.

4. OPERATING EXPENSE. (a) *Feed and Salt.* Feed for the herd involves an outlay covering the purchase of cotton seed cake or its equivalent in other grains and roughage. Feeding during the late winter and early spring months insures better calves and tends to decrease the death loss in the breeding herd. While feeding is not resorted to on all ranches, nevertheless the practice is now fairly well established.

Some kind of salt is now put out on nearly all ranches. The old time custom of letting cattle find natural salts such as alkali, or eating bones, is no longer looked upon with favor among up-to-date cattlemen. The cost varies in accordance with the kind put out—rock, pressed into blocks or loose.

(b) *Labor.* The labor charge includes wages and the cost of subsistence for the men employed. It is customary to furnish quarters and food for the men and sometimes for their families also. Usually two men are required to care for one thousand cows and their increase up to the time of weaning. Additional expenses for labor as well as supplies are incurred in connection with "dipping." The cattle are dipped in a solution for the eradication of mange, ticks and other parasites. Additional labor charges are also incurred for "round-ups."

(c) *Repairs.* Repairs cover the outlays for the upkeep of fences, windmills, buildings and the ordinary repairs of equipment.

(d) *Taxes.* Taxes comprise state and county taxes on land, improvements, breeding herd and equipment.

(e) *Miscellaneous Expense.* In miscellaneous expense are included such items of overhead expense as the salaries of ranch managers, office and legal expenses, dipping, etc.

5. DEATH AND ACCIDENT LOSS. While the income tax regulation which does not permit a reduction for cattle losses is sound in theory, as these losses are compensated in the inventory, nevertheless in the matter of obtaining the production cost of a calf such losses must be included in order to secure a reliable valuation of the calf for succeeding inventories. The sound accounting procedure to take care of this item is to reduce the inven-

tory at the beginning of the year by the amount of the actual death and accident loss, thereby obtaining the actual cost figures. Under this method the losses are covered in the cost figures where they belong; not in the inventory, where they are lost sight of. If a correct cattle tally is kept the actual yearly death and accident loss in the breeding herd is ascertained, usually during the fall round-up.

6. DEPRECIATION. (a) *The Breeding Herd.* The depreciation of the breeding herd is a mooted question. The useful number of years is seven for both cows and bulls. Some hold that inasmuch as a cow after she has raised several calves is sold as a "canner," the item of depreciation is for this reason eliminated. Others hold that even if the cow is not sold but is permitted to live out her life, there is no depreciation because of the fact that she has raised her complement of calves. On the same basis it might be said with equal reason that there is no depreciation in an automobile because of the fact that the original cost was compensated for in the number of rides taken. The depreciation in a breeding herd is the difference between original cost and what the cows and bulls will bring as "canners" at the end of their useful years as members of the herd. This loss must be taken care of by the inclusion of a yearly depreciation included in calf cost at the annual rate of one-seventh of the difference between cost and selling price.

(b) *Equipment.* The cost figures should also include annual depreciation charges to provide for the replacement of ranch equipment based upon the life of such equipment.

(c) *Improvements.* The fact that the buildings, windmills, etc., are included in the price per acre when a ranch is purchased is no reason why a charge for depreciation on these improvements should not be made. For tax purposes improvements are assessed separately from the land. Buildings deteriorate, windmills and well cylinders wear out, casings and pipes corrode and wells fail, necessitating replacement and the development of new water. In the purchase of a ranch, an amount covering an appraised value of the improvements should be determined and deducted from the purchase price, leaving a figure which will represent the net cost of land. New improvements and betterments are capital expenditures and should not be included in costs, but the depreciation on such improvements must be if our costs are to be accurate and reliable.

7. WORKING FUNDS. The item "Working Funds" is used to cover the cash outlay for operating expenses. Whether such expenditures are made from borrowed money or from capital owned, the interest is a deduction from profits rather than an addition to costs, and should be so treated.

8. THE PERCENTAGE OF INCREASE. The percentage of increase is the calf crop; that is, the number of calves that the herd produces during the period.

From the foregoing analysis of the items which enter into the cost of producing a calf it is apparent that these items may be divided into two groups—range costs and charges against profits.

The prime production cost of a calf (using the calf as a unit) will be the total range cost divided by the number of calves produced. However, before this figure can be used as a basis for the determination of selling price it is necessary to add to it a proper portion of the charges against profits, the latter, of course, also being reduced to the unit of one calf. The procedure is indicated in the following illustration:

RANGE COSTS

FACTORS			
4-a	Feed	$ X	
4-a	Salt	X	
4-b	Labor	X	
4-c	Repairs	X	
4-d	Taxes	X	
4-e	Miscellaneous expense	X	
5	Death and accident loss—breeding herd	X	
6-a	Depreciation—breeding herd	X	
6-b	Depreciation—equipment	X	
6-c	Depreciation—improvements	X	
	Total range cost	X	
8	Total range cost divided by the number of calves produced gives the range cost per calf		X_1

CHARGES AGAINST PROFITS

1	Rental of land or interest on land notes payable	Y	
2	Interest on borrowings—breeding herd loans	Y	
3	Interest on borrowings—equipment purchases	Y	
7	Interest on borrowings—working funds	Y	
	Total charges against profits	Y	
	Total charges against profits divided by the number of calves produced gives the portion of this item chargeable to cost per calf		Y_1
	Production cost of one calf six months old		X_1+Y_1

YEARLING PRODUCTION COSTS

Having established cost figures for the production of calves at the age of six months, it is necessary to adopt a somewhat different procedure in the succeeding six months or up to the time the calves become yearlings.

The factors which enter into the determination of yearling costs are similar to those which were considered above in connection with the cost of producing calves six months old. They are (it will be noted that the key numbers run continuously):

9. Cost of Calves
10. Interest on borrowings, operating expense, breeding herd
11. Range
12. Equipment
13. Operating Expense
    (a) Labor
    (b) Repairs
    (c) Taxes
    (d) Miscellaneous Expense
14. Death and Accident Loss of Calves
15. Depreciation
    (a) Equipment
    (b) Improvements
16. Working Funds

9. COST OF CALVES. The total cost of the calves is of course the unit cost as determined above or the purchase price multiplied by the total number of calves.

10. INTEREST ON BORROWINGS, OPERATING EXPENSE, BREEDING HERD. If the item working funds, factor 7 above, consists of borrowed money, the interest will run for the period of six months from the date when the calf is weaned until it is one year old.

11. THE RANGE. The range is provided under the same plans as were outlined above for calf production, the chief requirement being adequate acreage. It is considered that about five acres are sufficient to run a calf six months old to the age of one year.

12. EQUIPMENT. In case the breeding herd equipment on hand is not sufficient, additional equipment must be purchased in order to take care of the calves.

13. OPERATING EXPENSE. It is assumed that no additional feed or salt is purchased.

(a) *Labor.* The labor charge is similar to that explained in connection with calf production, one man to each one thousand calves being considered about right.

(b) *Repairs.* This item should cover the actual outlay for ordinary repairs in connection with running and raising the calves to yearlings.

(c) *Taxes.* The taxes chargeable in this period are state and county taxes on that part of the land set aside for running the calves, the taxes on the calves themselves and the amount to cover the additional equipment purchased.

(d) *Miscellaneous Expense.* This item covers actual outlay similar to that explained under item No. 4-e above.

14. DEATH AND ACCIDENT LOSS. The actual number of calves lost at the cost price.

15. DEPRECIATION. (a) *Equipment.* This item should cover the fair wear and tear of the additional equipment purchased.

(b) *Improvements.* This is a similar item covering deterioration of buildings and other improvements so far as they are used for raising the calves to yearlings.

16. WORKING FUNDS. This is the cash outlay covering operating expenditures, whether capital owned or money borrowed.

It is now possible to indicate the method of arriving at the unit cost for the production of a yearling in the same way as was done in the case of calf costs.

CALVES AND RANGE COSTS

FACTORS			
9	Calves cost	$	X
13-a	Labor		X
13-b	Repairs		X
13-c	Taxes		X
13-d	Miscellaneous expense		X
14	Death and accident loss—calves		X
15-a	Depreciation—equipment		X
15-b	Depreciation—improvements		X
	Total operating costs		X
	Total calf cost plus range costs divided by the number of yearlings, gives the prime cost per yearling		X_1

CHARGES AGAINST PROFITS

FACTORS		
10	Interest on borrowings, operating expense breeding herd.....	Y
11	Rental of land or interest on land notes payable	Y
12	Interest on borrowings—purchase of additional equipment.....	Y
16	Interest on borrowings—working funds..	Y
	Total charges against profits.....	Y
	Total charges against profits divided by the number of yearlings gives the portion of this item chargeable to each yearling	Y_1
	Total production cost of yearling...	X_1+Y_1

On some ranches the yearling steers and the surplus heifers are then sold to other outfits who run these yearlings until they are two, three, four or five years old, or in some cases even older, before they are sold to feeders direct, or are shipped to the market. On other ranches, if there is sufficient range, these yearling steers and surplus heifers are run until favorable sales can be made; provided there is no curtailment of credit, or no other financial pressure which compels sales to be made.

It is customary to raise a number of heifer yearlings until the age of three years to be used in replacing the cows lost through death and accident. The costs of raising yearlings to the ages indicated in the above table are based on the actual yearly operating expenditures, death and accident losses, depreciation charges and charges against profits. The acreage required to maintain non-breeding cattle usually is about fifteen acres for a yearling, eighteen acres for a two-year-old and twenty acres for a three-year-old or over.

The following figures based upon actual conditions may serve to illustrate the principles outlined above:

CALF PRODUCTION COST

FACTORS:			
1	Range—Net cost of land and fences, 25,000 acres @ $3.00	$75,000.00	
1	Improvements—buildings and windmills (cost).	10,000.00	$85,000.00
2	Cows—1,000 head @ $60.00	60,000.00	
2	Bulls—50 head @ $150.00	7,500.00	67,500.00
3	Equipment—Saddle horses, 20 head @ $60.00	1,200.00	
	Wagon mules, 4 head @ $150.00	600.00	
	Wagons, harness, etc. (cost)	2,200.00	4,000.00
7	Working funds		10,280.00
4-a	Feed—Cotton seed cake, 30 tons @ $60.00		1,800.00
4-a	Salt—500 blocks @ 50c		250.00
4-b	Labor—twelve months—2 men @ $100.00		2,400.00
4-c	Repairs—fences, windmills, etc. (12 months) @ $50.00		600.00
4-d	Taxes—State and county—land, 25,000 acres @ 10c.	2,500.00	
	State and county—improvements $10,000 @ 4c.	400.00	
	State and county—herd, 1,050 head @ 69c	730.00	3,630.00
4-e	Miscellaneous—Office and legal	300.00	
	Dipping	500.00	
	Round-ups	600.00	
	Horse feed, etc	200.00	1,600.00
5	Death and accident loss—cows @ 7%, 70 head @ $60.00	4,200.00	
	Bulls @ 14%, 7 head @ $150.00	1,050.00	5,250.00
6-a	Depreciation—Cows: 1,000 head cost. $60,000.00		
	Less death loss, 70 head 4,200.00		
	Balance, 930 head $55,800.00		
	Value as canners, 930 head @ $20 18,600.00		
	Depreciation—one-seventh of $37,200.00	5,310.00	
	Depreciation—Bulls: 50 head cost 7,500.00		
	Less death loss, 7 head, cost 1,050.00		
	Balance, 43 head, cost $6,450.00		
	Value as canners, 43 head @ $25 1,075.00		
	Depreciation—one-seventh of $5,375.00	770.00	6,080.00
6-b	Equipment, saddle horses and mules @ 15% (cost $1,800.00)	270.00	
	Wagons, harness and tools @ 20% (cost $1,200.00)	240.00	510.00
6-c	Improvements @ 5% (cost $10,000.00)		500.00

RANGE COST

FACTORS:

4-a	Feed	$ 1,800.00
4-a	Salt	250.00
4-b	Labor	2,400.00
4-c	Repairs	600.00
4-d	Taxes	3,630.00
4-e	Miscellaneous	1,600.00
5	Death and accident loss—breeding herd	5,250.00
6-a	Depreciation—breeding herd	6,080.00
6-b	Depreciation—equipment	510.00
6-c	Depreciation—improvements	500.00
	Total Range Cost	$22,620.00
8	Calf crop—700 on basis of 70% increase.	
	Range Cost per Calf	**$32.31**

CHARGES AGAINST PROFITS

FACTORS:

1	Rental of land, or interest on land notes payable, or interest on investment of $85,000 @ 6%.	$ 5,100.00
2	Interest on borrowings breeding herd loans, or interest on investment of $67,500 @ 6%.	4,050.00
3	Interest on borrowings purchase of equipment, or interest on investment of $4,000 @ 6%	240.00
7	Interest on borrowings working funds, or interest on investment of $10,280 @ 6%	610.00
	Total Charges Against Profits	$10,000.00
8	Calf crop—700 on basis of 70% increase.	
	Charges against profits per calf	14.29
	Production Cost of Calf Six Months Old	46.60

YEARLING PRODUCTION COST

FACTORS:

9	Calves cost, 700 head @ $32.31		$22,620.00
10	Range—net cost of land and fences, 5,000 acres @ $3.00	$15,000.00	
11	Improvements—buildings and windmills, cost	2,000.00	17,000.00
12	Equipment—saddle horses, 5 head @ $60.00		300.00
13	Feed and salt—none		.....
13-a	Labor—six months, 1 man @ $100.00		600.00
13-b	Repairs—fences, windmills, etc., 6 months @ $10.00		60.00
13-c	Taxes—state and county—Land, six months, 5,000 acres @ 5c	250.00	
	Improvements, six months, $2,000 cost, @ 2c	40.00	
	Calves, six months, 700 head @ 40c	280.00	570.00

13-d	Miscellaneous—Vaccination of calves, 700 head @ 25c	180.00		
	Office and legal	60.00		
	Horse feed, etc	50.00		290.00
14	Death and accident loss—calves, 28 head @ $32.31			900.00
15-a	Depreciation—equipment, six months—saddle horses, 15%, cost $300			20.00
15-b	Depreciation—improvements—5%, cost $2,000.00			50.00

RANGE COST

FACTORS:

9	Calves cost		$22,620.00	
13-a	Labor	$600.00		
13-b	Repairs	60.00		
13-c	Taxes	570.00		
13-d	Miscellaneous	290.00		
14	Death and accident loss—calves	900.00		
15-a	Depreciation—equipment	20.00		
15-b	Depreciation—improvements	50.00		
	Total Range Cost		2,490.00	
	Total Calf and Range Cost		$25,110.00	
	Number of yearlings produced, 672 (700 calves—28 loss)			
	Range Cost per Yearling			**$37.37**

CHARGES AGAINST PROFITS

FACTORS:

	Breeding herd, calves (Factors 1-2-3-7), per yearling		$14.88	
10	Interest on borrowings—cash outlay production of calves, $10,280.00, or interest on investment six months @ 6%	300.00		
11	Rental of land, or interest on land notes payable, or interest on investment of $17,000.00 six months @ 6%	510.00		
12-	Interest on borrowings purchase of equipment, or interest on investment of $300.00 six months @ 6@.	10.00		
16	Interest on borrowings working funds, or interest on investment of $1,520.00 six months @ 6%	50.00		
	Charges Against Profits—yearling account	$ 870.00		
	Per yearling		1.29	
	Total Charges Against Profits—Per Yearling			16.17
	Production Cost of Yearling One Year Old			$53.54

RESUME

Total range cost—breeding herd (Factors 4-5-6)	$22,620.00	
Total range cost—yearlings (Factors 13-14-15)	2,490.00	
Total charges against profits—breeding herd (Factors 1-2-3-7)	10,000.00	
Total charges against profits—yearlings (Factors 10-11-12-16)	870.00	
Total	$35,980.00	
Production Cost of Yearling (number produced 672)		$53.54

Note: Extensions are in even tens of dollars with the exception of production cost per calf and production cost of yearling.

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