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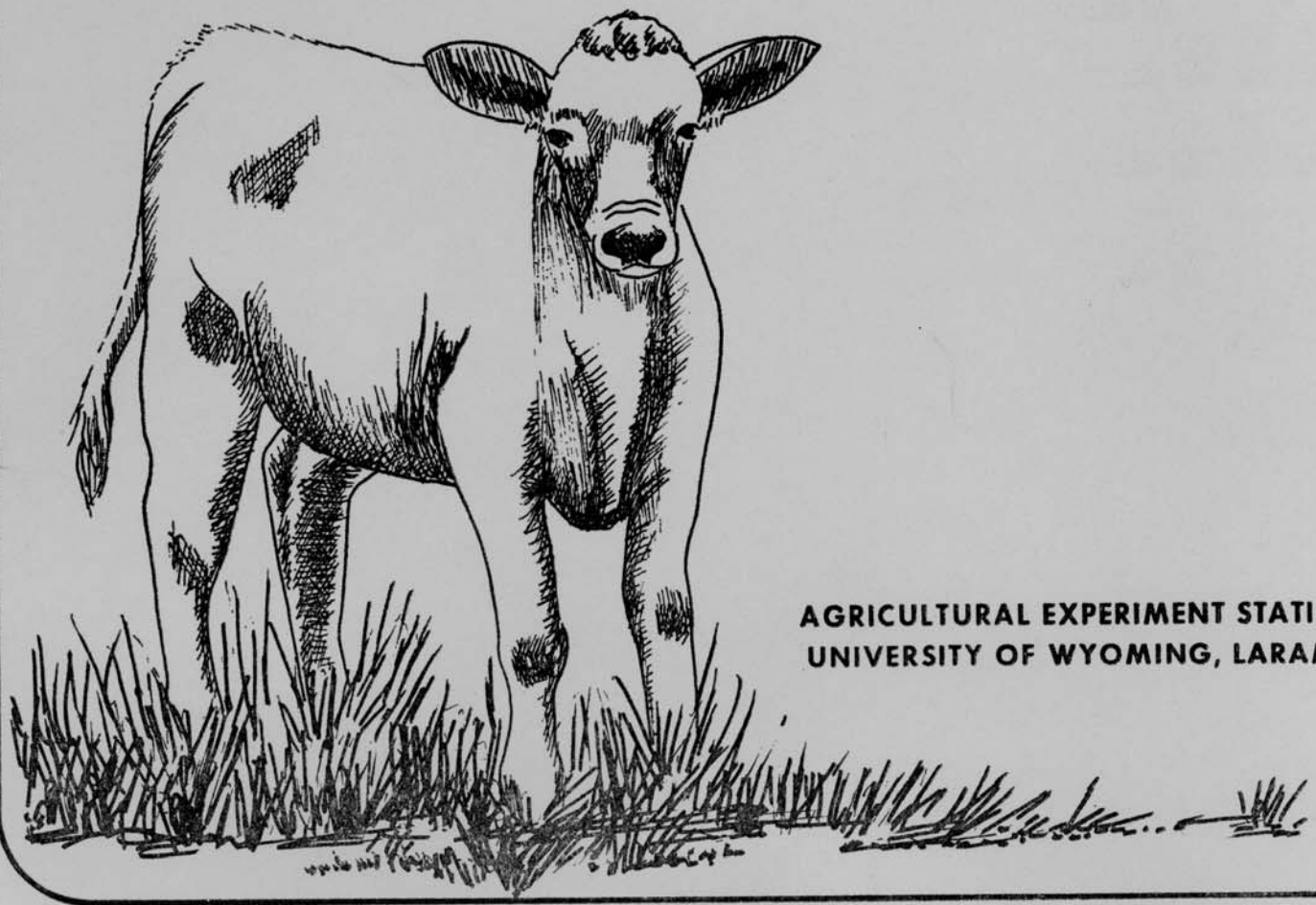
Economic Comparisons of the Cow-Calf and Cow Yearling Systems for Northern Plains Cattle Ranching



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SUMMARY AND CONCLUSIONS

Retention of cattle ownership has been suggested as a means of increasing ranch income for individuals and Wyoming's gross agricultural income. A cow-yearling system is one example of an approach to retention of cattle ownership.

One purpose of this analysis was to compare cow-calf and cow-yearling systems of operation as prices varied. Other objectives were to consider the effect of variations in calf crop, weaning weights of calves, or a combined effect on comparisons between cow-calf and cow-yearling systems.

Previous studies in western Nevada, northeastern Nevada, Wyoming, and southwestern North Dakota have indicated that the cow-yearling system usually produces higher net returns than the cow-calf system.

A previous study based on a ranch producing 5,800 AUMs of harvested feeds and range forages in northeastern Wyoming was used as a basis for this analysis. The previous study was revised to reflect 1966-70 average investment, prices, and cost levels.

Under average prices and normal calf crop and weights the cow-yearling system produces about $4,000 more net ranch income than the cow-calf system of equal size in AUMs of forage requirement.

The cow-calf system receives slightly more favorable income tax treatment than the cow-yearling system, due to a proportionately larger amount of cull cow sales receiving capital gains treatment. Net ranch income after taxes is about $3,000 more for the cow-yearling system than for the cow-calf system.

The effect of variations in cattle prices was considered by comparisons at the 1965 and 1970 price level, which differed substantially from the 1966-70 average price level. Net income for the cow-yearling system remained higher than for the cow-calf system regardless of price level.

The effect of variations in calf crop percentage was analyzed by comparing net income produced at 91.6 percent calf crop. Net income for the cow-yearling system increased slightly more than for the cow-calf system. When more calves are produced there are more young animals for sale, whether as calves or as yearlings.

The effect of changing weight of calves was illustrated by incrementing both steer and heifer calf sale weights by 60 pounds. Yearling weights were also incremented by 60 pounds for one comparison. That comparison resulted in some reduction in advantage of the cow-yearling system as compared to the cow-calf system. However, there was still an advantage for the cow-yearling system. A combination of increased weight and 91.6 percent calf crop further reduced the advantage, but again there was still some advantage for a cow-yearling system of operation.

If weights of yearlings increased in the same proportion as weight of calves there would still be some reduction of advantage for the cow-yearling system.

This study suggests that under typical northern plains conditions where hay is available for wintering calves, a cow-yearling system is likely to be superior to a cow-calf system. Variations in prices, weaning weights of calves or percentage calf crop within the ranges considered are not likely to tip the balance in favor of a cow-calf system.

The type of resources available on a ranch might make an important difference in the choice between cow-calf or cow-yearling system. That would be a subject for further research.

The analysis has represented typical management and conditions rather than an optimum program for wintering of calves. Wintering calves to gain 1.0 to 1.5 lb. per head per day, if home grown forage is available, would very likely enhance the cow-yearling system advantage considerably. Such a program would introduce many changes in the analysis and would also be a subject for further research.

A further advantage of the cow-yearling system is in the flexibility it can give for coping with feed supply variations. During a severe winter such as occurred in southwestern Wyoming in 1971-72, weaned calves could be sold or easily transported to some other area. The feed they normally use would be a feed reserve for the cow-herd and replacements. The same could also apply in other parts of the state and in areas where drouth might affect summer forage as well as winter feed supplies.

Filing income tax on the basis of a fiscal year ending about the last of October could be helpful from the standpoint of flexibility. Then if it was necessary to sell a calf-crop in the same calendar year that yearlings were sold, the sales could be in different fiscal years.

Flexibility attributes of cow-calf and cow-yearling systems is also a subject for further research.

ECONOMIC COMPARISONS OF THE COW-CALF AND COW-YEARLING SYSTEMS FOR NORTHERN PLAINS CATTLE RANCHING

W. Gordon Kearl*

INTRODUCTION

Ranch properties, particularly those which have scenic or recreational attributes, typically sell at prices above the earning capacity of the ranch. Consequently, the cash return on investment in cattle ranching has been relatively low for many years. Appreciation in value allows ranch operators to expand their borrowing and increase their debt as asset value increases. However, appreciation in value does not provide current income to meet family living or operating expenses, unless borrowed money is used for that purpose.

Rate of return on investment, considering both appreciation in value and cash return, may be comparable to returns on investment in common stocks of moderate growth industries. Even so, the relatively low cash return on investment in ranching has been a problem of great concern. Ranch operators who are moderately to heavily in debt and must pay five to eight percent interest on a substantial part of an investment which only earns two or three percent are especially conscious of the problem.

Retention of ownership of young cattle which might be accomplished with wintering, backgrounding, or fattening programs has been suggested as a way to increase returns to management, labor, and capital. Discussions of these programs often imply that the ranch operator retains ownership but not the physical possession and management of the livestock. Often there is an implication that these programs would be carried out under some type of contractual relationship with another party.

Cow-Calf or Cow-yearling Systems

Retention of both ownership and control of cattle is represented by a ranch operator wintering his own calves, pasturing them as yearlings, and selling them at about 16 or 17 months of age. This is a "cow-yearling" system which is still very common in Wyoming and many other states. There is much talk of "cow-calf operations" and frequently an implication that the cow-calf system of ranching is predominant in Wyoming. Data from three different sources can be used to challenge that implication.

Through 1963-67, the Wyoming Stockgrowers' Association sponsored a program advertising cattle for sale. More ranches offered calves than yearlings, but the offerings were smaller. Yearling cattle for sale outnumbered calves by a ratio of about 56 to 44.[1]

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[1]W. Gordon Kearl, "Weight of Feeder Cattle and Calves Offered for Sale in Wyoming, 1963-67," Wyoming Agricultural Experiment Station Bulletin 533R, March 1971.

Review of interstate movement of cattle out of Wyoming indicates that "steers and heifers," presumably mostly yearlings or older, exceeded the movement of calves by a ratio of 60 to 40, up to as much as 71 to 29 during different years from 1960 through 1970. Steers and heifers comprised 65.6 percent of interstate movement of young cattle (steers and heifers plus calves) in 1960, reached a low of 59.8 percent in 1961, a high of 70.9 percent in 1968, and stood at 66.6 percent in 1970.[2]

Review of cattle inventories for 1965-69 indicates that about two thirds of the Wyoming calf crop was retained in the January 1 inventories, and the remaining third was sold.[3]

A previous study compared cow-calf, cow-yearling, fall or spring purchased stocker systems, and various combinations, based upon 1956-65 average price and approximate 1963-65 average investment and cost levels.[4] Frequently, questions are asked about comparison of cow-calf and cow-yearling systems at more current price and cost levels. Questions are also raised about the effect of different calving percentages, calf weaning weights, or a combination of the two on comparisons between cow-calf and cow-yearling systems of operation.

[2]"Number of Wyoming Cattle and Calves Moved on Brand Certificates," Wyoming Cooperative Crop and Livestock Reporting Service, U. S. Dept. of Agriculture and Wyoming Dept. of Agriculture. Annual Issues.

[3]"January 1 Livestock Inventory and Lamb and Calf Crop Reports—Wyoming," Wyoming Cooperative Crop and Livestock Reporting Service, U. S. Department of Agriculture and Wyoming Department of Agriculture, Annual Issue.

[4]W. Gordon Kearl, "Comparative Livestock Systems for Wyoming Northern Plains Cattle Ranching," Wyoming Agricultural Experiment Station Bulletin 504, September 1969.

OBJECTIVES

The objectives of the analysis are as follows:

(1) To revise previous analyses in order to reflect more current price, cost, and investment levels;

(2) To demonstrate the effects of variations in prices on comparative net incomes between cow-calf and cow-yearling systems of operation;

(3) To illustrate the effects of variation in percent calf crop, weaning weight of calves, or the combined effect on comparisons between cow-calf and cow-yearling systems of operation.

REVIEW OF LITERATURE

Budgets for typical ranches operating on a cow-calf or a cow-yearling basis have been prepared for western Nevada, northeastern Nevada, and for the Northern Plains area of Wyoming.[5,6,7]

When the Nevada ranch budgets are paired according to size, five out of six cow-yearling systems produce more net ranch income per animal unit than the corresponding cow-calf system (Table 1). The cow-calf system was only superior for the smallest ranch. Four of the twelve ranch budgets had negative rates of return on total investment, five had between 0 and 2.3 percent return.

Warm-up feeding operations in conjunction with cow-yearling systems and a finishing operation in conjunction with a cow herd were considered as alternatives in western Nevada. A 940 animal unit cow herd with a warm-up operation produced a 4.7 percent return on total investment compared with a 2.3 percent return for a 912 animal unit cow-calf operation. A 605 animal unit cow herd with finishing operation produced a 3.6 percent return on total investment compared with a negative return for a 395 animal unit cow-calf operation and a 2.1 percent return for a 565 animal unit cow-yearling operation.

In the Wyoming study, the resource situation and feed purchases allowed operation of a 500 animal unit ranch which was held constant between the cow-calf and cow-yearling operations. The cow-calf system produced $22 net ranch income per animal unit compared with $26 for the cow-yearling system. Return on investment was 1.99 percent for the cow-calf system compared with 2.44 percent for the cow-yearling system.

Beef cattle and land management systems were the subject of a study in North Dakota.[8]

The study used static and multiperiod linear programming for a representative resource situation typifying ranches in southwestern North Dakota. Programs considered were as follows:
(1) Cow-calf, calves marketed at weaning age;
(2) Cow-calf, calves marketed in April, with two alternative wintering programs;
(3) "Cow-calf," but with the calves wintered and pastured through summer and marketed as yearlings in September. (A cow-yearling system.)
(4) A steer buy-sell system.

Profit maximizing plans were developed under alternative capital and credit situations. Specific results of the static analysis were as follows:
(1) The "cow-calf" system with marketing of yearlings was the profit maximizing alternative at interest rates near the usual levels.
(2) The cow-calf system with wintering calves for the higher rate of gain and sales in April maximized profits when interest rates were near zero.
(3) Under certain circumstances a steer buy-sell alternative became the most profitable choice.

The cow-calf system with sale of calves at weaning age was not profitable enough to appear in any of the optimizing programs.

[5]LeRoy F. Rogers, "Budgets for Western Nevada Cattle Ranches," Nevada Agricultural Experiment Station. MS8.

[6]LeRoy F. Rogers, "Budgets for the Northeastern Nevada Cattle Ranches," Nevada Agricultural Experiment Station. MS9.

[7]W. Gordon Kearl, "Comparative Livestock Systems for Wyoming Northern Plains Cattle Ranching. Wyoming Agricultural Experiment Station Bulletin 504. (1969).

[8]Gary Wade Paulson, "Economic Analysis of Beef Cattle and Grassland Management Systems," Department of Agricultural Economics, North Dakota State University of Agriculture and Applied Science (M. S. thesis), 1970.

Table 1. Summary of net ranch incomes per animal-unit and rates of return on total investment for selected typical ranching operatings in the western states – 1956-1965 average prices and conditions.

Ranch location and size and type	Cow-calf		Cow-yearling	
	Net ranch income per A.U.	Rate of return	Net ranch income per A.U.	Rate of return
	(Dols.)	(Percent)	(Dols.)	(Percent)
Western Nevada[1]				
160 A-U	38	[a]	----	----
200 A-U	----	----	23	[b]
395 A-U	12	[b]	----	----
565 A-U	----	----	24	2.1
912 A-U	19	2.3	----	----
2,065 A-U	----	----	29	5.4
Northeastern Nevada[2]				
234 A-U	10	[b]	----	----
298 A-U	----	----	13	[b]
530 A-U	14	.4	----	----
673 A-U	----	----	18	1.3
1,571 A-U	22	3.1	----	----
2,003 A-U	----	----	25	3.5
Wyoming[3]				
503 A-U	22	2.0	26	2.4
Western Nevada[1]				
Cow-yearling with warm-up				
225 AU			21	[a]
940 AU			33	4.7
Cow-herd with finishing				
605 AU			37	3.6

[a] Less than .05 percent.

[b] Return on investment not calculated because it would be negative.

SOURCES: [1]LeRoy F. Rogers, "Budgets for Western Nevada Cattle Ranches", Nevada Expt. Sta. MS8.

[2]LeRoy F. Rogers, "Budgets for Northeastern Nevada Cattle Ranches", Nevada Expt. Sta. MS9.

[3]Willis Gordon Kearl, "Comparative Livestock Systems and Technologies on Ranches in the Northern Plains Region of the United States", Ph.D. Dissertation, University of California, Berkeley, California. (1968).

BASIC RANCH RESOURCES AND INVESTMENT

Land inventories for the basic ranch operation used in the previous study comparing various livestock system are summarized in Table 2.[9,10]

The investment in land and improvements which presumably does not include abnormal speculative values has been adjusted to allow a 6 percent compounded annual rate of appreciation (Table 3).

Table 2. Summary of land inventories, basic ranch, northeastern Wyoming.

	Acres		Animal
	Owned	Leased	months
All hay[a]	300	50	
Crested wheatgrass	125	------	
Native range	10,415	3,550	
Public lands	------	------	610
Total	10,840	3,600	610

[a] Hay yields .9 tons per acre, sufficient for cattle and saddle horses. Total production of 315 tons with no sales.

The 1969 index of machinery and motor vehicle costs is approximately 18 percent above the 1965 level of the original study. If about half the machinery and equipment has been acquired since 1965, then a 10 percent upward adjustment in the value of the inventory of machinery and equipment is appropriate. Investment in real estate, machinery and equipment, plus horses amounts to $387,950. Investment in these items is not crucial to comparisons which follow.

Cost indices used to make adjustments in investment and operating costs are summarized in Appendix Table 1.

[9]Kearl, W. Gordon, "Comparative Livestock Systems for Wyoming Northern Plains Cattle Ranching," Wyoming Agricultural Experiment Station Bulletin 504, September 1969.

[10]_____ "Comparative Livestock Systems and Technologies on Ranches in the Northern Plains Region of the United States." Ph.D. Dissertation, University of California, Berkeley, California, 1968.

Inventory composition varies between cow-calf and cow-yearling systems. Investment in cattle inventories has been adjusted from the level used in the source study to a level representing 1966-70 average prices (Table 4). Inventories shown, whether cow-calf or cow-yearling, require about 5,800 AUMs of range forage and hay. Because of use of more purchased feeds, the cow-yearling system is actually 509 AUs compared to 502 AUs for the cow-calf system. Inventories are based upon a calf crop of 83.3 percent, of cows and heifers coming two-year-olds which can calve in the spring. That is several percent better than the state average, but would be attaintable with slightly better than average management.

Table 3. Summary of investment in resources other than cattle, basic ranch, northeastern Wyoming.

Item	Amount
Owned land	$313,726
Buildings and improvements	47,974
Machinery and equipment	24,750
Horses	1,500
Total	$387,950

Table 4. Cattle inventories and investment, northeastern Wyoming.

Livestock system and class of cattle	Number January 1	Investment	
		Per head	Total
Cow-calf			
Cows past "2's"	317	$180	$ 57,060
Heifers coming "2's"	63	180	11,340
Heifers coming "1's"	79	135	10,665
Steers coming "1's"	16	105	1,680
Bulls	13	380	4,940
Total			$ 85,685
Other resources (Table 3)			387,950
Total investment			$473,635
Cow-yearling			
Cows past "2's"	262	$180	$ 47,160
Heifers coming "2's"	52	180	9,360
Heifers coming "1's"	131	112	14,672
Steers coming "1's"	131	129	16,899
Bulls	13	380	4,940
Total			$ 93,031
Other resources (Table 3)			387,950
Total investment			$480,981

Table 5. Cattle sales, northeastern Wyoming, 1966-70 average prices.

Livestock system and class of cattle	Number[a] (head)	Average weight (lb.)	Total weight[a] (cwt.)	Price per cwt.	Value
Cow-calf					
Cows	56	1,000	564.26	$16.73	$ 9,440
Yearling heifers	15	680	102.39	26.65	2,729
Heifer calves	79	360	285.30	29.75	8,488
Steer calves	142	390	556.34	33.10	18,415
Yearlings	16	598	93.07	30.80	2,867
Total					$41,939
Cow-yearling					
Cows	47	1,000	466.36	$16.73	$ 7,802
Yearling heifers	77	620	479.20	27.30	13,082
Yearling steers	129	705	906.94	29.50	26,755
Total					$47,639

[a] Numbers sold are rounded, but weight is calculated considering effect of death loss on average sales over a period of time.

CATTLE SALES

Cattle sales are summarized in Table 5. Cattle prices are the 1966-70 average prices at Omaha. Cull cow prices are averages of commercial, utility, cutter, and canner grades for November. Calf prices are based on November prices for choice grades. Yearling prices are for choice grades in October. Interpolations have been made to give prices for specific weights of young stock sold.

Other work indicates that prices received by Wyoming ranchers are slightly below prices at Omaha.[11] Calf prices differentials were $.23 per cwt. in October and $.37 per cwt. in November, averaged through 1966-70. The prices received in Wyoming did not allow for marketing costs, which would be variable depending upon method of sale and distance to delivery point. Marketing costs would be minimal with direct sale and delivery near the ranch, and might approach $.75 to $1.00 per cwt. for marketing at local auctions after moderate length of haul from a ranch.

Prices are not adjusted for any differential from Omaha. Consequently, they may be slightly higher than prices actually received in Wyoming. However, the prices for various classes are mutually consistent and give valid comparisons between the cow-calf and cow-yearling systems. The basis for assumptions about livestock inventories and sale weights are well documented in sources cited previously. Sales on the cow-calf system include a few heavy yearling heifers culled from the replacements and a few light steers which were tail-end calves the previous year.

[11] W. Gordon Kearl, "Comparison of Calf Prices in Wyoming with Surrounding Markets," Unpublished Mimeo, Division of Agricultural Economics, University of Wyoming, June 1972.

ESTIMATED COSTS

Estimated costs for a cow-calf and cow-yearling system of operation are shown in Table 6. These costs are based upon the levels shown by the source publication, adjusted by the ratio of change in average indices between 1963-1965 and 1966-1970.

Table 6. Estimated costs for cow-calf and cow-yearling livestock systems, northeastern Wyoming, 1966-70.

	Cow-calf			Cow-yearling		
	Total	Per A.U.	Per Cow	Total	Per A.U.	Per Cow
Total costs						
Hired labor	$ 4,416	$ 8.80	$11.62	$ 4,516	$ 8.87	$14.38
Feed	3,431	6.83	9.03	4,446	8.73	14.16
Rent	2,800	5.58	7.37	2,800	5.50	8.92
Taxes	2,043	4.07	5.38	2,183	4.28	6.95
Veterinary	498	.99	1.31	560	1.10	1.78
Motor supplies	1,569	3.13	4.13	1,605	3.15	5.11
Repairs	2,016	4.02	5.31	2,145	4.21	6.83
Insurance	585	1.17	1.54	585	1.15	1.86
Utilities	552	1.10	1.45	670	1.32	2.13
Miscellaneous	2,508	5.00	6.60	2,508	4.93	7.99
Interest on opearting costs	715	1.42	1.88	771	1.51	2.46
Replacement of bulls	1,027	2.05	2.70	1,027	2.02	3.27
Depreciation other	5,078	10.12	13.36	5,078	9.98	16.17
Total operating costs	$27,238	$54.28	$71.68	$28,894	$56.75	$92.01

Table 7. Summary of net income and returns to factors, northeastern Wyoming, 1966-70.

Item	Cow-calf	Cow-yearling
Ordinary ranch income		
Sales	$41,939	$47,639
Perquisites	1,400	1,400
Total receipts	$43,339	$49,039
Expenses	$27,238	$28,894
Net ranch income	$16,101	$20,145
Operator's labor	$ 4,200	$ 4,200
Management	2,097	2,382
Return to operator's capital	$ 9,804	$13,563
Percent return to capital[a]	2.07	2.82
Ranch income after taxes		
Ordinary income[b]	$ 5,261	$10,943
Capital gains[c]	4,720	3,901
Adjusted gross income	9,981	14,844
Exemptions and deductions[d]	3,998	4,200
Taxable income	5,983	10,644
Taxes due	997	1,962
Net ranch income	$16,101	$20,145
Taxes due	997	1,962
Net ranch income after taxes	$15,104	$18,183
After tax returns to total capital	$ 8,807	$11,601
Percent return after taxes	1.86	2.41

[a] Based on $473,635 and $480,981 total capital for cow-calf and cow-yearling systems, respectively.
[b] Income from calf or yearling sales, minus expenses.
[c] Fifty percent of value of cull cow sales.
[d] $675 each for four people plus 13 percent of adjusting gross income, up to a limit of $1500.

The change in the index for "production, interest, taxes, and wage rate" was used to adjust the cost items for labor, taxes, veterinary, insurance, and utilities. The ratio of change in feed costs was used to adjust the feed cost item. Motor supplies were adjusted using the change in motor supplies index.

Repair costs were adjusted using a composite index. Indices for motor vehicles, farm machinery, and building and fencing materials were given equal weights to represent the parts and materials requirement for repairs. That part in turn was given a weighting of 50 percent and "production, interest, taxes, and wage rates

index" was given a weighting of 50 percent to represent the labor component. The weighted composite index was then used to adjust repair costs.

Miscellaneous costs were adjusted using the change in the index for farm supplies, since it was felt that miscellaneous costs were primarily small farm supply type items.

The indices for motor vehicles and farm machinery were given equal weight and used to adjust the depreciation item. Since the time difference between 1963-65 and 1966-70 is less than normal life for most items which would be depreciating, only half the full adjustment indicated by the change in indices was applied.

Interest on operating costs were recalculated as was the replacement cost on bulls, rather than being adjusted by indices.

Use of the combined index to adjust labor costs probably results in an understatement of the increase in labor costs, but probably overstates some of the other items adjusted by it. Also, there may have been some slight increase in labor efficiency since 1963-65.

SUMMARY OF NET INCOME

Net income is summarized in Table 7. Sales are as previously shown in Table 5. Perquisites are included at $1,400, to offset costs which are included in operating costs and interest on investment.

Expenses are as summarized in Table 6. Net ranch income, calculated by deducting expenses from total receipts, is about $4,000 larger for the cow-yearling system than for the cow-calf system.

An allowance for operator's labor at $1.75 per hour for 2,400 hours and allowance for management of 5 percent of gross sales are also shown.

Net farm income less the allowances for operator's labor and management gives return to total capital, or operator's capital, assuming full ownership, as is done in this case. Percentage return to capital is 2.07 for the cow-calf system and 2.82 for the cow-yearling system.

The effect of income taxation varies between livestock systems, and also vary as prices or productivity vary. Net income derived from calves or yearlings sold is treated as ordinary income for tax purposes. Receipts from breeding cow sales is capital income which is taxed as capital gains. A cow-calf system receives slightly more favorable tax treatment because cow sales are proportionally greater on the cow-calf system than on the cow-yearling system. Also, net income does not increase proportionately as prices increase, or as productivity increases, because of the progressiveness of taxation on higher income.

Net ranch income after taxes is also summarized in Table 7. Ordinary income is cash receipts from sales of young cattle, less all expenses. Fifty percent of the value of cull cow sales is capital gains if taxes are filed on a cash basis. The $1,400 for perquisites allowed in calculating net ranch income has been excluded and income taxes calculated for a family of four using the 1971 tax schedule for a couple filing a joint return. Standard exemption, $675 each, plus 13 percent of adjusted gross income up to $1,500 as a standard deduction have been allowed.

Net ranch income after taxes was calculated by deducting taxes due from net ranch income determined in a previous calculation. The cow-yearling system showed an advantage of about $3,000 in net ranch income after taxes over the cow-calf system of operation.

EFFECT OF VARIATIONS IN CATTLE PRICES

Effect of variations in prices was examined by comparing sales and net income at two price levels which differed from the 1966-70 averages shown previously. In order to have consistent prices at differing levels, prices for 1965 and 1970 were used for this comparison and are summarized in Table 8, along with the 1966-70 average prices.

A set of alternative prices for 360 pound heifer calves and 390 pound steer calves is shown in Table 8. Assuming all other prices remain as shown, these prices will result in net ranch incomes after taxes for the cow-calf system equal to those for the cow-yearling system.

Prices for all classes of cattle move in some relationship to each other. As prices for calves increase the prices for yearlings increase. The spreads between calf prices and yearling prices widen in an absolute amount as prices rise but in percentage terms relationships stay almost constant.

Value of sales is summarized in Appendix Table 2 and net income before and after taxes is summarized in Appendix Table 3.

The effects of variations in prices on net ranch income comparisons between cow-calf and cow-yearling systems are summarized in Table 9. The cow-yearling system shows approximately a $2,700 to $3,000 advantage in net ranch income after taxes over the cow-calf system, regardless of price level used. Differences between systems in net ranch income before taxes range from about $3,500 to $4,000 and $4,700 at various price levels. At higher price levels, progressive income taxes take successively larger portions of income from the cow-yearling system as compared with the cow-calf system.

Average calf prices a little over $4.05 per cwt. above the prices actually occurring in 1965 would be required to achieve equalization of net incomes at those price levels. These prices are represented by increases of $4.10 in the steer calf prices and $4.00 in heifer calf prices above those actually occurring. These changes result in more than a $5.00 differential between 360 pound heifer calves and 620 pound heifer yearlings. The differential between 390 pound steer calves and 705 pound yearlings is increased from $3.10, which actually occurred, to $7.20.

At the 1970 average price levels even greater changes in the differentials between weights would be required. A $6.45 differential between heifer calf and yearling heifer prices would be sufficient, where a $2.45 differential actually occurred. A $9.80 differential per cwt. between 390 pound steer calves and 705 pound yearling steers would be required where a $4.60 differential actually occurred.

Results intermediate between these extremes are shown for 1966-70 average prices.

It is invalid to compare differences between calf and yearling prices within a month such as September or November. Valid comparisons must be between yearling prices in September or October and calf prices in November. These are the months when yearlings and calves are typically sold. This differential will be less than the differential found in comparing the prices within the same months because typically prices are higher in September than in November.

EFFECT OF VARIATIONS IN CALF CROP PERCENTAGE

Variations in percentage calf crop were examined by budgeting estimated effects of calving percentages at one level higher than 83.3 percent, which was used in the basic study. A 91.6 percent calf crop would be associated with management far above average but is probably obtainable on a consistent basis year after year. Good cow nutrition before and after calving, good animal health, good care of newborn and young calves, and perhaps use of some other technologies would be required to obtain a 91.6 percent calf crop. A calf crop at that level allows only 2 to 3 percent each for open cows or abortions, still-births, and calf death-loss between birth and weaning.

Ranch operators frequently claim calf crops weaned of 95 percent and more on a consistent basis. Careful examination of the records sometimes shows that the percentage has been calculated on cows three years old and over. Diseases such as vibrio or calf scours, severe weather during calving season, drouth and scant feed between calving and breeding seasons can all reduce calf

Table 8. Alternative price levels for evaluations of cow-calf and cow-yearling systems, (dollars per hundredweight).

Kind and weight	Prices for	Years 1965	1966-70	1970
Cull cows	Nov.	$13.27	$16.73	$18.36
Heifers				
360 pounds	Nov.	24.40	29.75	34.20
620 pounds	Oct.	23.15	27.30	31.75
680 pounds	Oct.	22.75	26.65	31.00
Steers				
390 pounds	Nov.	28.30	33.10	37.85
598 pounds	Oct.	26.05	30.80	35.05
705 pounds	Oct.	25.20	29.50	33.25
Alternative calf prices[a]				
Heifers		28.40	34.20	38.20
Steers		32.40	37.70	43.05

[a] These are prices for 390 pound steer and 360 pound heifer calves which will result in approximate parity of net ranch income after taxes between cow-calf and cow-yearling systems, assuming all other prices remain as shown above.

Table 9. Effect of variations in prices on comparisons between cow-calf and cow-yearling systems.

Item	Price levels 1965	1966-70	1970
Net ranch income			
Before taxes			
Cow-calf	$ 9,108	$16,101	$21,772
Cow-yearling	12,643	20,145	26,439
After taxes			
Cow-calf	9,003	15,104	19,734
Cow-yearling	11,949	18,183	23,023
Return to capital			
Before taxes			
Cow-calf	3,161	9,804	15,192
Cow-yearling	6,436	13,563	19,542
After taxes			
Cow-calf	3,056	8,807	13,154
Cow-yearling	5,742	11,601	16,126
Percent return to capital			
Before taxes			
Cow-calf	.67	2.07	3.21
Cow-yearling	1.34	2.82	4.06
After taxes			
Cow-calf	.65	1.86	2.73
Cow-yearling	1.21	2.41	3.35

crops on occasion. Four calf crops at 95 percent and one calf crop at 70 percent result in a 90 percent average.

Variations in percentage calf crop result in variations in forage requirements per breeding cow unit (one cow plus associated fractional part of replacement heifers, bulls, etc.). Consequently, as calf crop percentage varies, the number of breeding cows, replacement animals and bulls also varied. Forage requirements were kept approximately constant, but amount of concentrates purchased was allowed to vary freely.

Cattle inventories for the cow-calf and cow-yearling systems at 83.3 and 91.6 calving percentages are summarized in Appendix Table 4. Sales information for 1966-70 and 1970 average prices are summarized in Appendix Table 5.

Average weights of different classes of cattle and average price per hundredweight have been shown previously (Table 5), and remain constant over various calf crop percentages. In fact, one would expect a larger proportion of calves to be produced by two year old heifers at the highest calving percentage. Average weight of calves would likely be depressed slightly compared to weight of calves produced at the 83.3 percent calf crop levels. Keeping weights constant as calf crop varies results in slightly overstating gross receipts and net returns at higher calving percentages. Thus, the advantage of higher calf crops would be overstated slightly, but the comparison between cow-calf and cow-yearling systems would still be valid.

Costs of operation are dependent upon size of operation and composition of livestock inventories. Size of operation in terms of acres of land, improvements, machinery investment, and carrying capacity in terms of forage was held constant. Many of the costs also remained constant.

When percentage calf crop increased on the cow-calf system, the inventory of cows was reduced slightly, both summer and winter, due to the increased feed requirement for additional calves. A larger number of calves were on the range during the summer period but variable costs of carrying these additional calves are minimal. The net effect was to reduce operating expenses slightly, due to reduction of cow-herd numbers.

When percentage calf crop was increased on the cow-yearling system the cow-herd was decreased to allow for more forage use by calves and yearlings. The number of weaned steer and heifer calves through yearling age was increased. Expenses increased slightly.

Principal expenses that were changed as calf crop varied on the cow-yearling system were feed purchased, taxes on cattle, and veterinary expenses. Many of the expense categories remain constant because size of operation was held constant. Number of breeding cow units and number of calves change in opposite directions as calf crop varied and cost changes in some expense categories tend to cancel out.

Advantages in net ranch income for the cow-yearling system over the cow-calf system which were shown at the 83.3 percent calf crop were maintained or increased slightly at the 91.6 percent calf crop (Table 10). Details of this comparison are shown in Appendix Table 6.

In summary, the estimated effect of variations in calf crop on net ranch income are made under the following assumptions and conditions:
(1) Inventories of livestock were varied as calf crop varied, in order to retain approximately constant forage requirements.

(2) Average weights of calves were held constant as percentage calf crop varied. A large number of two and three year old heifers must necessarily wean calves at the 91.6 percent calving level. Because of this, it is likely that average weights would be depressed slightly at the higher calving percentage compared to the lower calving percentage. The effect of holding weight constant is to slightly overstate the increase in net income associated with the higher calving percentage.

(3) Costs were adjusted to allow for the increase or decrease of breeding cow units on the cow-calf and cow-yearling system. There was no attempt to estimate additional inputs or costs required to obtain the higher percentage calf crop as compared with the lower percentage calf crop.

If additional inputs or costs are actually required to obtain the higher calf crops, then the analysis, as it has been presented, would overstate the advantage in returns to the higher percentage calf crop.

Table 10. Effect of variations in calf crop percentage on comparisons between cow-calf and cow-yearling systems, 1966-70 average prices.

	83.3 percent calf-crop		91.6 percent calf-crop	
	Cow-calf	Cow-yearling	Cow-calf	Cow-yearling
Net ranch income				
Before taxes	$16,101	$20,145	$19,380	$23,918
After taxes	15,104	18,183	17,754	21,036
Return to capital				
Before taxes	9,804	13,563	12,923	17,137
After taxes	8,807	11,601	11,297	14,255
Percent return to capital				
Before taxes	2.07	2.82	2.73	3.55
After taxes	1.86	2.41	2.39	2.94

EFFECTS OF VARIATIONS IN CATTLE WEIGHTS AND CALF CROP PERCENTAGES

Effects of producing heavier weights of calves and yearlings at 83.3 and 91.6 percent calf crop were estimated by budgeting. Weights for these comparisons were arbitrarily set at 450 pounds for steer calves and 420 pounds for heifer calves, 60 pounds heavier than had been used previously as the normal weight (Table 11).

The relationship of yearling weights to calf weights may vary, depending on several factors.

(1) If the heavier weight of calf results from much greater fatness, then the increase in weight of yearlings may not be proportionate to the increase in weight of calves.

(2) If the greater weight of calves is produced through either selection, or through superior growth capabilities, as well as dam's superior milk production, then yearling's daily and seasonal gains should be at least equal to those which would be attained starting from a lighter weight.

(3) If the heavier weaning weight of calves is a result of a crossbreeding program which results in hybrid vigor, then it might be expected that yearling would make additional gain in proportion to the increase in calf gain.

Initially, comparisons will be made assuming that the increase in weight of calves of 60 pounds is carried over fully into the weight of yearlings, but there are no additional advantages. Thus, sale weights for yearling steers and heifers for the cow-yearling system and the relatively few yearling steers and heifers sold from the cow-calf system are also increased by 60 pounds. It has been assumed that the cow herd average weight and weight of cull cows also increases by 8.5 percent to 1,085 pounds, in proportion to the increase of yearling weights, but not fully proportionate to the increase in calf weights.

The effect of an increase in calf crop on cattle inventories has been explained previously, and shown for the normal weight situation in Appendix Table 4. The effect on cattle inventories for higher weights is also shown in Appendix Table 4. The heavier weights require an increase in feed requirements in terms of AUMs or net energy for maintenance and gain. Consequently, it is necessary to reduce the inventory, whether for the cow-calf or for the cow-yearling system, in order to maintain a requirement for ranch produced forage at 5,800 AUMs. When both weight and percentage calf crop are increased,

there are further slight reductions in inventory, as was shown previously for changes in percentage calf crop with weights at the normal level.

Effect of variations in weights, percentage calf crop, and prices on sales data are summarized in Appendix Tables 7, 8, 9, 10.

As explained previously, costs of operation are dependent upon the size of operation and composition of livestock inventories. Size of operation in terms of AUM carrying capacity and land, machinery, and improvement investment were held constant. Consequently, many of the costs also remain constant. The considerable reduction in livestock inventories results in some saving in costs such as labor directly with the animals, taxes, and veterinary expenses. However, a greater amount of purchased feeds are required. The net effect of various offsetting costs and adjustments was to leave expenses near the same levels shown previously (Appendix Table 11).

The cow-yearling system produced $18,183 ranch income after taxes compared to $15,104 by the cow-calf system at 83.3 percent calf crop with normal weights. That is an advantage of $3,079 (Table 12). The advantage of the cow-yearling system was increased to about $3,282 at normal weight and a 91.6 percent calf crop.

The advantage of the cow-yearling system over the cow-calf system was reduced to less than $1,700 when both calf and yearling weights were increased by 60 pounds and calf crop held at 83.3 percent. The cow-yearling system shows an advantage of over $1,250 when both calf crops and weights are increased. Details on income calculations are summarized in Appendix Tables 11 and 12.

The weight of cows was increased 8.5 percent for an approximate 16 percent increase in weight of calves. Consequently, sales of calves and net returns for the cow-calf system increased considerably as weights were increased. The increase in weight of yearlings sold was in proportion to the increase in weight of cows.

Increasing weight of all animals has two detrimental effects. First, additional feed requirements force a reduction in the inventory and the number of animals sold. That offsets part of the increased weight per head. Second, the heavier animals sell at a slightly reduced price.

If yearling weights are allowed to increase in proportion to the increase in calf weights, about 16 percent, and more than proportionate to the increase in cow weights, then heavier weights are advantageous. The advantage of the cow-yearling system over the cow-calf system is slightly greater than shown with normal weights. The cow-yearling advantage is considerably better than shown for the example with weights increasing by a constant 60 pounds regardless of the sex or age of the animal.

Table 11. Normal and heavy weights used for analyzing effects of variations in sale weights on net returns from cow-calf or cow-yearling systems (pounds).

Class of Cattle	Cow-calf			Cow-yearling		
		Weight increase			Weight increase	
	Normal	Constant[a]	Proportional[b]	Normal	Constant[a]	Proportional[b]
Cull cows	1,000	1,085	1,085	1,000	1,085	1,085
Yearling heifers	680	740	793	620	680	723
Heifer calves	360	420	420	------	------	------
Steer calves	390	450	450	------	------	------
Yearling steers	598	658	690	705	765	813

[a] A 60 pound increase for all calves and yearlings.

[b] Yearling weights increase above the normal level in the same proportion as calves increase.

Table 12. Net ranch incomes after taxes with calf crops and weights varying, 1966-70 average prices.

Weight and calf crop percentage	NRI after taxes: Cow-calf	NRI after taxes: Cow-yearling	Difference
Normal weights			
83.3 percent calf crop	15,104	18,183	3,079
91.6 percent calf crop	17,754	21,036	3,282
Heavy weights (60 lb. increase)			
83.3 percent calf crop	16,356	18,025	1,669
91.6 percent calf crop	18,998	20,254	1,256
Heavy weights (proportionate increase)			
83.3 percent calf crop	16,588	18,951	2,363
91.6 percent calf crop	19,180	21,238	2,058

EFFECT OF VARIATIONS IN WEIGHTS, CALF CROP PERCENTAGES, AND PRICES

With normal weights, calf crops, and 1966-70 prices the cow-yearling system showed advantages over the cow-calf system (Table 13). Increasing percentage calf crop with normal weight and normal prices further enhanced the advantage of the cow-yearling system by a very slight amount over the cow-calf system. With normal weights and higher prices, a cow-yearling system still showed slightly greater advantage. Therefore the combined effect of higher prices and a higher percentage calf crop would further enhance the advantage of the cow-yearling system over the cow-calf system. When prices are higher, they are higher for yearlings as well as calves, although the percentage change in price is not necessarily the same. Also, when calf crop is increased, it results in more yearlings available for sale, the same as it increases the number of calves for sale.

When sale weights are increased, either by constant 60-pound increase or by a proportionate increase, the superiority of the cow-yearling over the cow-calf system is reduced, but there is still an advantage in net ranch income (Table 13). The same is true if yearling weights increase in the same proportion as calf weights.

Table 13. Net ranch incomes after taxes with calf crops and weights varying, 1970 average prices.

Weight and calf crop percentage	Cow-calf	Cow-yearling	Difference
1966-70 Average prices			
Normal weights			
83.3 percent calf crop	15,104	18,183	3,179
91.6 percent calf crop	17,754	21,036	3,282
1970 Prices			
Normal weights			
83.3 percent calf crop	19,734	23,023	3,289
91.6 percent calf crop	22,566	26,094	3,528
Heavy weights (60 lb. increase)			
83.3 percent calf crop	20,887	22,778	1,891
91.6 percent calf crop	23,739	25,186	1,447
Heavy weights (proportionate increase)			
83.3 percent calf crop	21,127	23,647	2,520
91.6 percent calf crop	23,927	26,109	2,182

APPENDIX

Table A-1. Indices of prices paid by farmers in the U. S. for selected production items, 1963-65 and 1966-70 and percentage change (1910-14 = 100).

Production item	Average indices 1963-65	Average indices 1966-70	Ratio change	1970	Ratio change
Feed	206	211	1.024	216	1.049
Livestock	336	406	1.208	450	1.339
Motor supplies	175	185	1.057	194	1.109
Motor vehicles	455	523	1.149	567	1.246
Farm machinery	415	487	1.173	537	1.294
Farm supplies	268	280	1.045	292	1.090
Buildings and fencing materials	389	434	1.116	469	1.206
Fertilizer	152	149	.974	148	.974
Seed	232	247	1.065	265	1.142
Wages and other[a]	326	374	1.147	408	1.252

[a] Production, interest, taxes and wage rates.

Source: "Agricultural Prices, 1970 Annual Summary," Crop Reporting Board, Statistical Reporting Service, U. S. Department of Agriculture, Washington, D. C., June 1971.

Table A-2. Cattle sales at normal weights and calf crop percentage and varying prices.

Livestock system and class of cattle	Number[a] (head)	Average weight (lb.)	Total weight[a] (cwt.)	1965 Price	1965 Value	1970 Price	1970 Value
Cow-calf							
Cows	56	1,000	564.26	$13.27	$ 7,488	$18.36	$10,360
Yearling heifers	15	680	102.39	22.75	2,329	31.00	3,174
Heifer calves	79	360	285.30	24.40	6,961	34.20	9,757
Steer calves	142	390	556.34	28.30	15,744	37.85	21,057
Yearling steers	16	598	93.07	26.05	2,424	35.05	3,262
Total					$34,946		$47,610
Cow-yearlings							
Cows	47	1,000	466.36	$13.27	$ 6,189	$18.36	$ 8,562
Yearling heifers	77	620	479.20	23.15	11,093	31.75	15,215
Yearling steers	129	705	906.94	25.20	22,855	33.25	30,156
Total					$40,137		$53,933

[a] Numbers sold are rounded but weight and total value are calculated considering the effect of death loss on average sales over a period of time.

Table A-3. Summary of net income and returns to factors, northeastern Wyoming, lower and higher price levels.[a]

Item	Cow-calf		Cow-yearling	
	1965	1970	1965	1970
Ordinary ranch income				
Total receipts	$36,346	$49,010	$41,537	$55,333
Expenses	27,238	27,238	28,894	28,894
Net ranch income	$ 9,108	$21,772	$12,643	$26,439
Operator's labor and management	$ 5,947	$ 6,580	$ 6,207	$ 6,897
Return to capital	3,161	15,192	6,436	19,542
Percentage return to capital[b]	.67	3.21	1.34	4.06
Ranch income after taxes				
Ordinary income[c]	$ 220	$10,012	$ 5,054	$16,477
Capital gains[d]	3,744	5,180	3,094	4,281
Adjusted gross income	$ 3,964	$15,192	$ 8,148	$20,758
Exemptions and deductions	$ 3,215	$ 4,200	$ 3,759	$ 4,200
Taxable income	$ 749	$10,992	$ 4,389	$16,558
Taxes due	105	2,038	694	3,416
Net ranch income	9,108	21,772	12,643	26,439
Taxes due	105	2,038	694	3,416
Net ranch income after taxes	$ 9,003	$19,734	$11,949	$23,023
After tax returns to capital[b]				
Amount	3,056	13,154	5,742	16,126
Percent	.65	2.73	1.21	3.35

[a] Lower and higher price levels represented by 1965 and 1970 levels.

[b] Investments are $473,635 and $480,981 total capital for cow-calf and cow-yearling systems respectively. Cattle inventories are valued on longer term values represented by 1966-70 averages, rather than current market prices.

[c] Sales of young cattle less expenses.

[d] Assumes filing on a cash basis with the cost basis for cull cows sold of $0.0. Half the value of cull cow sales is capital gains.

Table A-4. Summary of effects on cattle inventory of varying percentage calf crops or weights of cattle for a fixed forage supply.

Livestock system and class of cattle	Weights and calf crop percent			
	Normal weight		High weight	
	83.3%	91.6%	83.3%	91.6%
Cow-calf				
Cows past "2's"	317	313	296	292
Heifers coming "2's"	63	63	59	58
Heifers coming "1's"	79	78	74	73
Heifer calves[a]	(158)	(172)	(148)	(160)
Steer calves[a]	(158)	(173)	(147)	(160)
Steers coming "1's"	16	16	15	15
Bulls	13	13	12	12
Cow-yearling				
Cows past "2's"	262	257	244	237
Heifers coming "2's"	52	51	49	47
Heifers coming "1's"	131	141	122	130
Heifer calves[a]	(131)	(142)	(122)	(130)
Steer calves[a]	(131)	(142)	(122)	(130)
Steers coming "1's"	131	142	122	130
Bulls	13	13	12	12

[a] Calves born and weaned during the year, rather than inventory.

Table A-5. Summary of sales from cow-calf and cow-yearling systems at normal weights and 91.6 percent calf crop.

Livestock system and class of cattle	Number[a]	Weight		1966-70 Average		1970 Average	
		Average (lb.)	Total (cwt.)	Price	Value	Price	Value
Cow-calf							
Cull cows	56	1,000	557.50	$16.73	$ 9,327	$18.36	$10,236
Yearling heifers	15	680	101.18	26.65	2,696	31.00	3,137
Heifer calves	94	360	338.26	29.75	10,063	34.20	11,568
Steer calves	157	390	610.74	33.10	20,215	37.85	23,117
Yearling steers	15	598	91.97	30.80	2,833	35.05	3,224
Total					$45,134		$51,282
Cow-yearling							
Cull cows	46	1,000	457.80	$16.73	$ 7,659	$18.36	$ 8,405
Yearling heifers	89	620	550.13	27.30	15,018	31.75	17,467
Yearling steers	139	705	981.01	29.50	28,940	33.25	32,619
Total					$51,617		$58,491

[a] Numbers sold are rounded but weight and total value are calculated considering the effect of deathloss on average sales over a period of time.

Table A-6. Summary of net income and returns to factors, cow-calf and cow-yearling systems at 91.6 percent calf crops, and varying prices, northeastern Wyoming.

Item	1966-70 Prices		1970 Prices	
	Cow-calf	Cow-yearling	Cow-calf	Cow-yearling
Ordinary ranch income				
Total receipts	$46,534	$53,017	$52,682	$59,891
Expenses	27,154	29,099	27,154	29,099
Net ranch income	$19,380	$23,918	$25,528	$30,792
Operator's labor and management	6,457	6,781	6,764	7,125
Return to capital	$12,923	$17,137	$18,764	$23,667
Percent return to capital[a]	2.73	3.55	3.97	4.91
Ranch income after taxes				
Ordinary income[b]	$ 8,653	$14,860	$13,892	$20,987
Capital gains[c]	4,664	3,829	5,118	4,202
Adjusted gross income	$13,317	$18,689	$19,010	$25,193
Exemptions	4,200	4,200	4,200	4,200
Taxable income	$ 9,117	$14,489	$14,810	$20,993
Taxes due	$ 1,626	$ 2,882	$ 2,962	$ 4,698
Net ranch income	$19,380	$23,918	$25,528	$30,792
Taxes due	1,626	2,882	2,962	4,698
Net ranch income after taxes	$17,754	$21,036	$22,566	$26,094
After tax return to capital	$11,297	$14,255	$15,802	$18,969
Percent return to capital (after tax)	2.39	2.95	3.34	3.93

[a] Capital $472,780 and $482,450 for the cow-calf and cow-yearlings systems after allowing for change in cattle inventories. Inventories valued at longer term (1966-70) average values.

[b] Sales of young cattle less expenses.

[c] Assumes filing on a cash basis with the cost basis for cull cows sold of $0.0. Half the value of cull cow sales is capital gains.

Table A-7. Ranch inventories and sales, weights increased by 60 pounds for calves and yearlings, 83.3 percent calf crop, and varying prices.

Livestock system and class of cattle[a]	Inventory	Sales[c]						
			Weight		1966-70 Average		1970 Average	
		Number	Average	Total	Price	Value	Price	Value
			(lb.)	(cwt.)				
Cow-calf								
Cows past "2's"	296	52	1,085	566.91	$16.73	$ 9,484	$18.36	$10,408
Heifers coming "2's"	59	----	----	----	----	----	----	----
Heifers coming "1's"	74	14	740	103.60	26.05	2,699	30.25	3,134
Heifer calves[b]	(148)	74	420	309.58	29.10	9,009	33.20	10,278
Steer calves[b]	(147)	133	450	596.25	32.30	19,259	36.75	21,912
Steers coming "1's"	15	15	658	98.24	30.10	2,957	34.00	3,340
Total						$43,408		$49,072
Cow-yearling								
Cows past "2's"	244	44	1,085	475.88	$16.73	$ 7,961	$18.36	$ 8,737
Heifers coming "2's"	49	----	----	----	----	----	----	----
Heifers coming "1's"	122	72	680	488.58	26.70	13,045	31.00	15,146
Heifer calves[b]	(122)	----	----	----	----	----	----	----
Steer calves[b]	(122)	----	----	----	----	----	----	----
Steers coming "1's"	122	120	765	920.83	28.80	26,520	32.35	29,789
Total						$47,526		$53,672

[a] Twelve bulls are also required with each inventory, but are not listed.

[b] Calves born and weaned during the year, rather than in January 1 inventory.

[c] Numbers are rounded but total weight and values are calculated giving effect to a non-integer average number sold over a period of time.

Table A-8. Ranch inventories and sales, weights increased by 60 pounds for calves and yearlings, 91.6 percent calf crop, and varying prices.

Livestock system and class of cattle[a]	Inventory	Sales[c]						
		Number	Weight		1966-70 Average		1970 Average	
			Average	Total	Price	Value	Price	Value
			(lb.)	(cwt.)				
Cow-calf								
Cows past "2's"	292	52	1,085	558.78	$16.73	$ 9,348	$18.36	$10,259
Heifers coming "2's"	58	----	------	-----	------	------	-----	-----
Heifers coming "1's"	73	14	740	102.12	26.05	2,660	30.25	3,089
Heifer calves[b]	(160)	87	420	366.95	29.10	10,678	33.20	12,183
Steer calves[b]	(160)	145	450	653.90	32.30	21,121	36.75	24,031
Steers coming "1's"	15	15	658	96.86	30.10	2,915	34.00	3,293
Total						$46,722		$52,855
Cow-yearling								
Cows past "2's"	237	43	1,085	461.34	$16.73	$ 7,718	$18.36	$ 8,470
Heifers coming "2's"	47	----	------	-----	------	------	-----	-----
Heifers coming "1's"	130	81	680	553.59	26.70	14,781	31.00	17,161
Heifer calves[b]	(130)	----	------	-----	------	------	-----	-----
Steer calves[b]	(130)	----	------	-----	------	------	-----	-----
Steers coming "1's"	130	128	765	975.76	28.80	28,102	32.35	31,566
Total						$50,601		$57,197

[a] Twelve bulls are also required with each inventory, but are not listed.

[b] Calves born and weaned during the year, rather than in January 1 inventory.

[c] Numbers are rounded but total weight and values are calculated giving effect to a non-integer average number sold over a period of time.

Table A-9. Ranch inventories and sales, 83.3 percent calf crop, calf and yearling weights increasing proportionately, and varying prices.

Livestock system and class of cattle[a]	Inventory	Sales[c]						
		Number	Weight		1966-70 Average		1970 Average	
			Average	Total	Price	Value	Price	Value
			(lb.)	(cwt.)				
Cow-calf								
Cows past "2's"	295	53	1,085	570.28	$16.73	$ 9,541	$18.36	$10,470
Heifers coming "2's"	59	----	------	------	------	------	------	------
Heifers coming "1's"	74	14	793	111.26	25.50	2,837	29.60	3,293
Heifer calves[b]	(147)	74	420	310.04	29.10	9,022	33.20	10,293
Steer calves[b]	(148)	133	450	597.92	32.30	19,313	36.75	21,974
Steers coming "1's"	15	15	690	100.05	29.70	2,971	33.50	3,352
Total						$43,684		$49,382
Cow-yearling								
Cows past "2's"	242	43	1,085	468.07	$16.73	$ 7,831	$18.36	$ 8,594
Heifers coming "2's"	48	----	------	------	------	------	------	------
Heifers coming "1's"	121	72	723	516.94	26.25	13,570	30.45	15,741
Heifer calves[b]	(121)	----	------	------	------	------	------	------
Steer calves[b]	(121)	----	------	------	------	------	------	------
Steers coming "1's"	121	119	813	967.47	28.25	27,331	31.60	30,572
Total						$48,732		$54,907

[a] Twelve bulls are also required with each inventory, but are not listed.

[b] Calves born and weaned during the year, rather than in January 1 inventory.

[c] Numbers are rounded but total weight and values are calculated giving effect to a non-integer average number sold over a period of time.

Table A-10. Ranch inventories and sales, 91.6 percent calf crop, calf and yearling weights increasing proportionately, and varying prices.

Livestock system and class of cattle[a]	Inventory	Sales[c]						
		Number	Weight		1966-70 Average		1970 Average	
			Average	Total	Price	Value	Price	Value
			(lb.)	(cwt.)				
Cow-calf								
Cows past "2's"	291	52	1,085	562.03	$16.73	$ 9,403	$18.36	$10,319
Heifers coming "2's"	58	----	-----	-----	----	----	----	----
Heifers coming "1's"	73	14	793	109.59	25.50	2,795	29.60	3,244
Heifer calves[b]	(160)	87	420	366.70	29.10	10,671	33.20	12,174
Steer calves[b]	(160)	146	450	654.84	32.30	21,151	36.75	24,065
Steers coming "1's"	14	14	690	98.60	29.70	2,928	33.50	3,303
Total						$46,948		$53,105
Cow-yearling								
Cows past "2's"	234	42	1,085	452.34	$16.73	$ 7,568	$18.36	$ 8,305
Heifers coming "2's"	47	----	----	----	----	----	----	----
Heifers coming "1's"	129	81	723	583.39	26.25	15,314	30.45	17,764
Heifer calves[b]	(129)	----	-----	----	-----	----	----	-----
Steer calves[b]	(129)	----	----	----	----	----	----	-----
Steers coming "1's"	129	127	813	1,028.53	28.25	29,056	31.60	32,502
Total						$51,938		$58,571

[a] Twelve bulls are also required with each inventory, but are not listed.

[b] Calves born and weaned during the year, rather than in January 1 inventory.

[c] Numbers are rounded but total weight and values are calculated giving effect to a non-integer average number sold over a period of time.

Table A-11. Net income, cow-calf and cow-yearling systems, weights increased by 60 pounds for calves and yearlings and varying calf crop, 1966-70 average prices.

Item	83.3 Percent calf crop		91.6 Percent calf crop	
	Cow-calf	Cow-yearling	Cow-calf	Cow-yearling
Total receipts	$44,808	$48,926	$48,122	$52,001
Expenses	27,211	29,007	27,151	29,135
Net ranch income	$17,597	$19,919	$20,971	$22,866
Ranch income after taxes				
Ordinary income	$ 6,713	$10,558	$10,223	$13,748
Capital gains	4,742	3,980	4,674	3,859
Adjusted gross income	$11,455	$14,538	$14,897	$17,607
Exemptions and deductions	4,189	4,200	4,200	4,200
Taxable income	$ 7,266	$10,338	$10,697	$13,407
Taxes due	$ 1,241	$ 1,894	$ 1,973	$ 2,612
Net ranch income	$17,597	$19,919	$20,971	$22,866
Taxes due	1,241	1,894	1,973	2,612
Net ranch income after taxes	$16,356	$18,025	$18,998	$20,254

Table A-12. Net income for cow-calf or cow-yearling systems as calf crop varies with proportionate calf and yearling weight gains, 1966-70 average prices.

Item	83.3 Percent calf crop		91.6 Percent calf crop	
	Cow-calf	Cow-yearling	Cow-calf	Cow-yearling
Total receipts	$45,084	$50,132	$48,348	$53,338
Expenses	27,211	29,007	27,151	29,135
Net ranch income	$17,873	$21,125	$21,197	$24,203
Ranch income after taxes				
Ordinary income	$ 6,932	$11,894	$10,394	$15,235
Capital gains	4,770	3,916	4,702	3,784
Adjusted gross income	$11,702	$15,810	$15,096	$19,019
Exemptions and deductions	4,200	4,200	4,200	4,200
Taxable income	$ 7,502	$11,610	$10,896	$14,819
Taxes due	$ 1,285	$ 2,174	$ 2,017	$ 2,965
Net ranch income	$17,873	$21,125	$21,197	$24,203
Taxes due	1,285	2,174	2,017	2,965
Net ranch income after taxes	$16,588	$18,951	$19,180	$21,238

Table A-13. Net income, cow-calf and cow-yearling systems, constant (60 pound) increases in calf and yearling weights, varying calf crop, and 1970 prices.

Item	83.3 Percent calf crop		91.6 Percent calf crop	
	Cow-calf	Cow-yearling	Cow-calf	Cow-yearling
Total receipts	$50,472	$55,072	$54,255	$58,597
Expenses	27,211	29,007	27,151	29,135
Net ranch income	$23,261	$26,065	$27,104	$29,462
Ranch income after taxes				
Ordinary income	$11,453	$15,928	$15,445	$19,592
Capital gains	5,204	4,368	5,130	4,235
Adjusted gross income	$16,657	$20,296	$20,575	$23,827
Exemptions and deductions	4,200	4,200	4,200	4,200
Taxable income	$12,457	$16,096	$16,375	$19,627
Taxes due	2,374	3,287	3,365	4,276
Net ranch income	23,261	26,065	27,104	29,462
Taxes due	2,374	3,287	3,365	4,276
Net ranch income after taxes	$20,887	$22,778	$23,739	$25,186

Table A-14. Net income for cow-calf or cow-yearling systems as calf crop varies with proportionate calf and yearling weight gains, and 1970 prices.

Item	83.3 Percent calf crop		91.6 Percent calf crop	
	Cow-calf	Cow-yearling	Cow-calf	Cow-yearling
Total receipts	$50,782	$56,307	$54,505	$59,971
Expenses	27,211	29,007	27,151	29,135
Net ranch income	$23,571	$27,300	$27,354	$30,836
Ranch income after taxes				
Ordinary income	$11,701	$17,306	$15,635	$21,131
Capital gains	5,235	4,297	5,160	4,152
Adjusted gross income	$16,936	$21,603	$20,795	$25,283
Exemptions and deductions	4,200	4,200	4,200	4,200
Taxable income	$12,736	$17,403	$16,595	$21,083
Taxes due	2,444	3,653	3,427	4,727
Net ranch income	23,571	27,300	27,354	30,836
Taxes due	2,444	3,653	3,427	4,727
Net ranch income after taxes	$21,127	$23,647	$23,927	$26,109