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INCOME ADJUSTMENTS FROM FEE AND PERMIT CHANGES ON UTAH CATTLE RANCHES USING PUBLIC RANGES YEARLONG

by

C. Kerry Gee

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Agricultural Economics

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

1962

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C. Kerry Gee

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INTRODUCTION

Within the boundaries of Utah are approximately 52.7 million acres of land. About 41 million acres are rangeland, of which 73 percent is federally owned and 5 percent state owned (6).[1] The portion owned by the Federal government is administered by the Bureau of Land Management (BLM) and the Forest Service. Most of this land is either arid or mountainous and has been used mainly for grazing in the past. It has other uses, however, such as mining, forestry, recreation, and watersheds. Due to recent increases in population, personal income, shorter work weeks, and improved transportation facilities, these alternatives are becoming strong competitors for the use of this land.

In Utah there are about 2,300 ranches using public range as part of their livestock feeding program. Approximately one-third of these use it on a year around basis (1).

Because of the multiple purpose nature of the public lands in Utah and the growing pressure from competing uses, the following questions have been raised: First, is the present use returning in revenues the true value of the resource? Second, is the present rate of use at a level that will facilitate the restoration, improvement, and maintenance of associated natural resources at their highest practical potential? Third, if adjustments are necessary, how will present users be affected?

---

[1]Numbers in parentheses refer to references listed in the bibliography.

The proper fee level for grazing permits on Federal ranges has been a point of dispute ever since the first fees were instituted on forest ranges in 1905. The first established fees were 20 to 35 cents per head for cows and horses for the regular summer grazing season and 35 to 50 cents per head for the entire year. Fees were raised in 1910, 1915, and 1927 in an effort to make them represent more closely the value of the feed. In 1933 the present method of adjusting fees according to the market price of cattle was started (3).

Grazing fees on BLM land have had a similar evolution, beginning in 1936 when they were set at five cents per animal unit month (AUM). The present system of basing fees on the combined prices of cattle and sheep was established in 1958 (3).

The practice of adjusting permitted AUM's has been used by Federal agencies as a means of equating the number of animals using a particular range with the grazing capacity of that range. In Utah for the nine-year period of 1951 to 1959, public grazing permits were reduced approximately 10 percent, or 259,735 AUM's, on BLM range and 15 percent or 82,845 AUM's, on forest range (Appendix Table 14). Generally, a cut in permits has been enacted by reducing the number of animals allowed on the range for the grazing season or by shortening the grazing time allowed.

Through time several patterns of use have been established by ranchers on the public range. The predominant pattern among ranches in Utah has been to graze forest range in the summer and BLM range in the fall, winter, and spring.

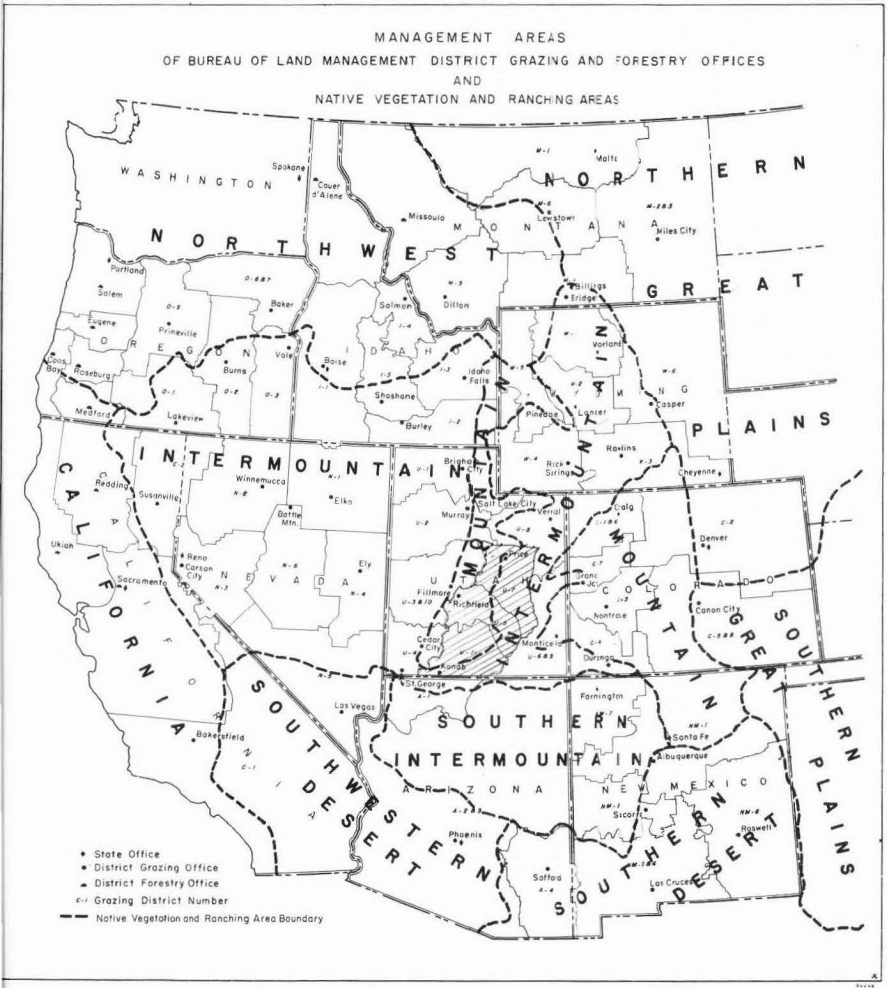

Figure 1. Overall study area, Utah survey area, and native vegetation and ranching areas.

The purpose of this study was to determine the income effect of specified increases in fees and reductions in permitted AUM's on Utah cattle ranches using public range on an annual basis. This is only one part of a study in the Western States directed by the Economic Research Service of the Department of Agriculture to determine the effect of fee and permit adjustments on ranch operations which rely on public range for part of their annual feed supply. The overall study area is shown in Figure 2.

No previous work has been done in Utah on these problems, though some range economics studies have been made (2).

Regional studies were conducted in 1947 (9) and again in 1961 (10) by the United States Department of Agriculture's Economic Research Service on costs and returns of commercial cattle ranches in the Intermountain area, but they are too general to be of use in analyzing local problems. Work has also been done in the Northern Plains area on economics of cattle ranching (11) but conditions in this area are so different from Utah that the data are not comparable.

An economic framework and conceptual solution

The theoretical framework of the problem assumes the form outlined below (Figure 2).

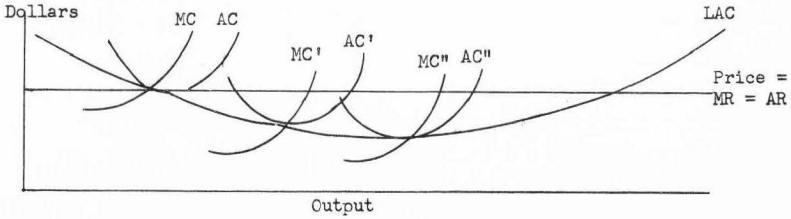

Figure 2. Envelope curve with three firm sizes depicted

On the long run, the average cost curve (LAC) is superimposed on the short run average cost (AC) and marginal cost (MC) curves for firms of three sizes, assuming economies of scale. The firms are faced with a market price of P which, under conditions of perfect competition, also equals the marginal revenue (MR) and average revenue (AR) curves for the firms. The vertical distance between the points where MC = MR and the AC curve for each firm represents the average net revenue for that particular firm with the given cost and price conditions. This value multiplied by the number of units of output produced equals the total net revenue for the firms. If expenses increase with no change in product prices, the cost curves will shift upward, thereby decreasing net revenue, or if prices increase and expenses are constant, net revenue would increase also. A decrease in output initiates a movement to the left along the individual firm cost curves resulting in a reduced total net revenue.

In the context of the economic framework outlined above, the questions posed in this study were: First, what will be the effect of four alternative increases in fees on net income for three typical sized cattle ranches in Utah which use BLM range in the fall, winter, and spring and forest range in the summer? Second, with a 20 percent reduction in permitted AUM's, what will be the effect on ranch income?

Assuming all other costs and revenues constant, raising fee levels would increase total costs and decrease net revenues in an amount equal to the change in fee expenses plus the change in interest on cash costs.

A reduction in permitted AUM's may be made in three ways: (a) reduce

the number of cattle permitted on the range; (b) shorten the grazing season; or (c) a combination of reducing grazing time and numbers of livestock permitted on the range.

In the short run four avenues are available for adjusting to a reduction in permitted AUM's: (a) cut herd size by selling cattle; (b) purchase feed, including hay, grain, or supplements, to fill the gap in the feeding program; (c) lease more land to make up the difference; or (d) use owned land to a better advantage.

Selling livestock would reduce both costs and revenues. The effect on net income would depend on which changes the most. With the other methods of adjustment revenues would remain constant or change very little and costs would increase. Purchasing feed would be the most expensive alternative.

If the grazing season were shortened, nothing would be gained by selling part of the herd but the other alternatives would still be applicable.

Cutting permitted AUM's by simultaneous reductions in time and numbers permitted would encourage essentially the same adjustments as when a reduction was made in time only.

Empirical procedures

A purposive sampling procedure was used in collecting primary data. The samples in Utah using public land were stratified on a basis of seasonal grazing patterns, herd size, type of operation, and physical characteristics of the public land used. The survey area is shown by

barred portion of Figure 1. Data were gathered through personal interviews with ranchers. Secondary sources were relied upon for some of the cost and price estimates and inventory values. A budgeting procedure was used to determine the effect on ranch income resulting from changes in fees or a reduction in permitted AUM's.

Assumptions

The problem was limited to a short-run situation in which the rancher did not have time to sell out or change the size of his owned physical facilities. To test the economies of scale hypothesis, three ranch sizes were considered and designated as small, medium, and large.

A cattle ranch of the type included in this study was an operation on which a cow-calf-yearling herd was the principal enterprise.

An average level of management was assumed for a typical ranch of each size. Identical rates of crop and livestock production were assumed because of the close geographic proximity of the typical ranches and the similarity in management. A static ranch situation was also assumed in which there was no change in inventories of livestock, equipment or buildings and improvements between the beginning and end of the year. A constant level of technology was also assumed. Two alternative levels of cattle prices were used in the budgets; first, projected Ogden prices; and second, 1960 Ogden prices.

The order of presentation

The remainder of this study is divided into four parts. First is a description of the three typical ranches including size, management

characteristics, and internal structure will be presented. A description of the impact on costs and revenues of adjustments in fees and permitted AUM's will be included in the second and third parts. The last part will be the summary and conclusions drawn from the study. Only summary tables will be presented in the body. Detail data are in the Appendix tables.

ORGANIZATION OF TYPICAL RANCHES

Although there is a wide variation in size among the typical ranches, they are in close agreement in their physical location, management practices, and internal structure.

Physical setting

Physiographically Utah is divided into three areas: the high Wasatch and Uintah mountains, the plateau region to the east and south of the Wasatch range, and the basin area extending from the mountains to the western borders of the state. Elevations range from 3,000 feet to heights of 6,000 and even 14,000 feet. Precipitation and temperature vary according to the altitude (5).

Between the desert floors and high mountain plateaus, vegetation belts have developed. On the high mountain slopes are conifers, aspens, many varieties of shrubs, perennial grasses and forbs (4). Dominating the lower more gentle slopes and high plains are sagebrush, junipers, rabbit brush, and various weeds and mixed grasses (7). Salt brush, shadscale, Russian thistle, and annual and perennial weeds comprise much of the desert vegetation (8).

Forage production is good at the higher elevations beginning in May and early June and continuing through August, September and into October, depending on when the snow comes.

Range at lower elevations, because of limited moisture, provides the best forage in the early spring and late fall and winter.

Though a large portion of the land is fertile, moisture deficiencies limit its use for agricultural purposes. Any form of agricultural activity other than livestock production is limited to selected valleys where irrigation projects are developed. In a few areas, however, rainfall is adequate to permit dry farming.

Ranch size classes

Using the number of breeding cows as an indicator of ranch size, the three predominant size groups in Utah were 40 to 60 head, 125 to 275 head, and 276 to 550 head of cows per ranch. The typical small ranch had 50 cows and the medium and large ranches 150 and 300 cows, respectively.

Size intervals were taken from a more inclusive study of Intermountain cattle operations using public range on an annual basis.

The distribution is skewed to the right and has one major mode (Figure 3). Forty percent of the operators had between 25 and 75 head of breeding cows, 22 percent had from 125 to 275 head of cows, and 10 percent had from 276 to 550 cows per herd.

Ranch dependency on public grazing

A primary consideration in this study was the importance of public grazing to the livestock feeding program. The extent to which all Utah cattle ranches of the type using public range the year around depend on BLM and forest permits for their feed supply was determined (Table 1). Dependencies on public range for the typical ranches studied were 54 percent for the medium and large sizes and 42 percent for the small.

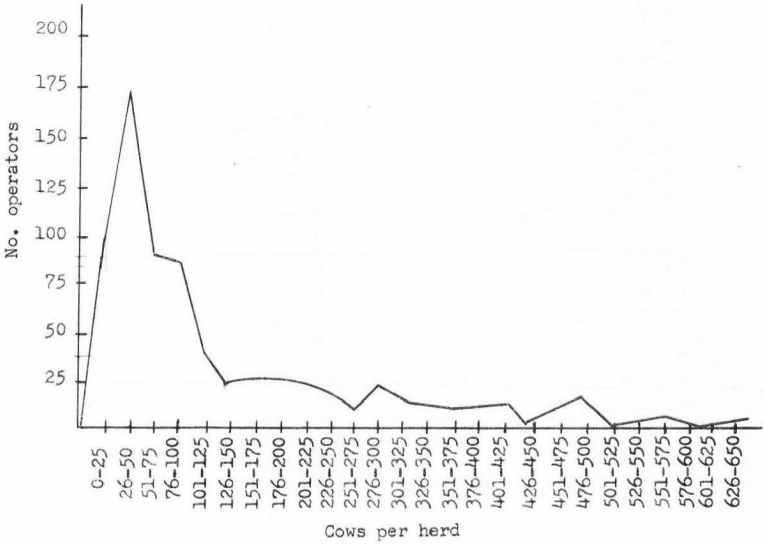

Figure 3. Frequency distribution of ranches based on number of breeding cows per herd

Table 1. Frequency distribution of ranch dependency on public range when the grazing pattern includes BLM range in the fall, winter, and spring, and forest range in the summer

	Ranches					
	Dependency on BLM range only			Dependency on BLM and forest range		
Percent	Small	Medium	Large	Small	Medium	Large
	(number)	(number)	(number)	(number)	(number)	(number)
0-9	5	13	11	1	10	6
10-19	7	32	11	9	17	9
20-29	11	17	10	9	22	10
30-39	10	23	9	9	22	9
40-49	14	19	8	17	18	12
50-59	14	18	13	13	21	14
60-69	13	26	15	14	30	13
70-79	7	8	12	6	12	15
80-89	9	13	8	10	15	6
90-100	3	8	7	4	9	10
				42	166	104

Management practices

A cow-calf-yearling type operation was predominant on the typical ranches. Herds included mature cows and replacement heifers, bulls, the current year's calf crop, and yearling steers. The yearling steers were late born calves the previous year held over the winter to be grass fattened during the current summer.

Livestock sales were made in October and November, after the cattle came off the forest. The center of the production area was assumed to be approximately 200 miles from the terminal market at which the cattle were sold.

The breeding season started between April and June and continued to the last of November. One bull accompanied each 20 to 25 cows on the summer range. Bulls ranging on national forests must be of a "B" grade or higher. Typically, bulls were kept three years on the medium ranch and four years on the large and small ranches. On the medium and small ranches bull losses were negligible, but the large ranch had a 6 to 7 percent death loss each year.

Replacement heifers were selected in the fall from the spring calf crop. No replacements were purchased. The bases of selection were size, conformation, and general appearance. Heifers were bred to calve between two and three years of age.

Generally, calves were born from January to September. However, about 70 percent of the births took place before June. A count of the calves was taken in the spring and again in the fall when they came off

the forest. An 85 percent calf crop was typical on Utah ranches. This percentage was for both replacement heifers and cows.

Management practices not already discussed included control of insects and pests and disease prevention. Dipping was used most in controlling insects and pests. Since individual ranchers did not have the necessary facilities, dip vats were provided by local cattlemen's associations.

Blackleg and brucellosis were the most prevalent diseases guarded against. All new calves were vaccinated with a combination blackleg and malignant edema vaccine. Heifers were tested for brucellosis.

The annual feeding programs and calendars of operations for the typical ranches were similar. Both winter and summer feeding was centered around the use of public range. The cow herd ran on the forest from June to October and on BLM range from November to May. Some additional feeding of hay, grain, and a protein supplement was done in the winter. Replacement heifers, late calves, and yearling steers were mostly kept on private range and pasture with some supplemental feed during the winter months (Appendix Tables 15, 16, and 17).

The major winter operation was feeding and care of the livestock. Calving started between January and March. Seedbeds were prepared and crops planted in March and April. Irrigating was done from May to August. Generally, two crops of hay were harvested, one the last of June and the other the last of July or the first of August. The grain was also harvested during August. While cattle were on the forest in the summer, salt

was put out and some herding and fencing done. Local cattlemen's associations often supervised this work.

Livestock inventories

Herd inventories included mature cows, replacement heifers, steer and heifer calves, and bulls.

Although the same classes of livestock appeared on each ranch (Appendix Table 18), there was some variation in the internal structure of the herds (Table 2).

The difference between the bull:cow ratio on the large ranch and the medium and small ranches may be attributed to the bull death loss suffered on the large ranch making larger bull inventories necessary. A significant difference also existed in the percentage of replacement heifers to cows. Death loss may also be a contributing factor to this variation. A final difference was in the percentage of the calf crop held over and sold as yearlings. Each ranch was stocked with saddle horses but no work horses were reported.

Land inventories

Land inventories included irrigated cropland, native and improved meadows, and rangeland (Appendix Table 19). The large ranch had leased as well as owned rangeland. No leasing was done by the medium or small ranch.

Alfalfa and barley were the principle crops grown on the irrigated land. In localized areas other crops predominated but were not widely enough grown to be included as typical. The small ranch with almost

Table 2. Comparative internal herd structure of typical ranches

Relationship	Ranch size		
	Small	Medium	Large
Bull:cow ratio	1:25	1:25	1:20
Percentage replacement heifers to cows	24	17	17
Percentage herd death loss excluding bull and calf death loss	6	3	3
Percentage bull death loss[1/]	0	0	7
Percentage calf crop	85	85	85
Percentage of calf crop held over as yearlings	28	16	14
Percentage breeding herd culled annually	14	14	11

1/ Over time there probably is bull death loss on small and medium ranches, but none was reported in the survey data.

twice the acreage of cropland per cow as the medium or large ranch was much more oriented to crop production.

Buildings and improvements

Little difference was found in inventories, construction, or condition of buildings and improvements among the typical ranches (Appendix Tables 20, 21,22). Stock sheds, corrals, feed troughs and mangers, water troughs, culinary wells, and granaries comprised the major inventory items. Medium and large ranches also had a machine shed and shop. Pole and frame construction was common. Generally, the buildings were old. Most of the owned land was under fence.

The typical Utah cattle rancher lived in town and had his farmstead in the surrounding country which explains the absence of a house in the inventory of buildings.

Machinery and equipment

Since the ranches were oriented to a livestock operation, a minimum amount of tillage and cropping equipment appeared in the inventories (Appendix Tables 23, 24, 25). Tractors, trucks, pickups, and cars are found on the ranches. Standard haying equipment included a mower, side delivery rake, baler, and hay wagon. Other cropping equipment consisted of a plow, disk, harrows, ditcher, and manure spreader. Miscellaneous livestock and shop equipment were in the inventories also. Drilling and harvesting of grain crops was done through custom services.

Summary of investment

Total investment included the value of the land, grazing permits, buildings and improvements, machinery and equipment, and livestock (Table 3). The small ranch had $60,094, the medium ranch $123,790, and the large ranch $220,100 invested in these items.

Table 3. Summary of investment by size for typical ranches, 1960

Item	Size of ranch		
	Small	Medium	Large
	(dollars)	(dollars)	(dollars)
Owned land	40,032	80,690	153,180
Buildings and improvements	2,572	6,860	11,144
Machinery and equipment	7,480	9,369	11,239
Livestock:			
Cattle	9,840	26,616	51,119
Horses	170	255	425
Total investment	60,094	123,790	227,107

On a per cow basis, the small ranch has a considerably larger total investment than the medium or large ranch (Table 4). It has approximately 40 percent more investment in land per cow than the other ranches and about four times more investment in machinery and equipment than the large ranch. The differences in investment per cow among the ranches suggest that economies of scale exist.

Labor requirements

The total labor used was 12.5 man-months, 17.2 man-months, and 28 man-months on the small, medium, and large ranches, respectively. (See Appendix Tables 26, 27, 28). It required 12.5 man-months of labor for 50 cows on the small ranch, while 5.7 and 4.7 man-months of labor were required for each 50 cows on the medium and large ranches.

The operator and his family provided most of the labor required. However, some hired day-labor was used on the small and medium ranches, while the large ranch employed one full-time worker. Generally, family labor was used full-time in the summer but only morning and evening during the school months. The small rancher had off-farm work about five months of the year.

Table 4. Investment in capital items per cow for typical ranches, 1960

Item	Ranch size		
	Small	Medium	Large
	(dollars/cow)	(dollars/cow)	(dollars/cow)
Land	678	408	391
Grazing permits	123	130	117
Building and improvements	51	46	37
Machinery and equipment	150	62	37
Total investment	1,203	825	757

Feed sources

All the hay and grain consumed was produced on the home ranch. Feed purchases consis of a protein supplement and salt (Appendix Tables 29, 30, 31). Frequently salt was used as a regulator in range feeding of supplements.

Sources of ranch income

Livestock and crop sales were the principal sources of revenue. Annual beef sales consisted of cull cows, calves, and yearling steers (Appendix Tables 33, 34). Calves weighed from 380 to 400 pounds and yearling steers about 600 pounds at sales time. Cull cows were generally those which were too old to produce or had some physical malfunction.

Crop sales consisted of hay and grain (Appendix Table 32). The amount sold was the excess over that which was consumed by the livestock and would vary each year according to their needs.

Costs and expenses

Costs and expenses included all cash outlays and the value of all items for which no direct cash payment was made (Appendix Table 35). Most of the items have been taken from previously discussed tables and are explained there.

Repairs and maintenance of machinery and equipment constituted the largest cash expense on the medium and small ranches. Labor expense had this distinction on the large ranch. Labor costs increased markedly between the medium and large ranches because the latter uses full-time hired help while the former gets by with small amounts of day-labor.

Grazing fees were 5 percent of the cash costs on the small ranch and 8 percent and 7 percent on the medium and large ranches. The large ranch had range lease expenses as well as grazing fees to pay.

Total cash costs were $3,613 for the small ranch, $6,118 for the medium ranch, and $14,217 for the large ranch.

Depreciation was the major non-cash cost. The straight-line method was used in arriving at the depreciation values. Depreciation was figures on bulls and horses because they were purchased as capital investments.

Interest on cash costs amounted to 6 percent for 6 months while the rate on capital investment was 5 percent per year.

Payment made to the operator and his family for their labor contribution was based on the wage rates for full-time and part-time labor.

Total ranch costs were $12,065, $20,938, and $36,287 for the small, medium, and large ranches, respectively.

Income and expense summary

Based on projected net cattle prices at Ogden,[2] the small ranch lost $135 and the medium and large ranches made $2,162 and $4,963, respectively, in terms of net income (Table 5). Using net prices at Ogden in October 1960,[3] net income for the small ranch was $166, the medium ranch $3,029, and the large ranch $6,783 (Table 6).

That the small ranch was more crop oriented is illustrated by the fact that 32 percent of its receipts came from crop sales while 13 percent

[2]See footnote 1, Appendix Table 33, for an explanation of how net projected prices are derived.

[3]See footnote 1, Appendix Table 34, for derivation of net October 1960 Ogden prices.

Table 5. Income and expense summary for typical ranches using net projected cattle prices, 1960

Item	Size of ranch		
	Small	Medium	Large
Receipts:			
Cattle sales	3,430	10,243	19,906
Crop sales	1,589	1,525	3,789
Total ranch income	5,019	11,768	23,695
Expenses:			
Cash costs	3,513	6,540	14,217
Non-cash costs	1,641	3,066	4,515
Total operating expenses	5,154	9,606	18,732
Net ranch income	- 135	2,162	4,963
Operator and family labor	3,800	4,950	6,200
Interest on investment	3,005	6,199	11,355
Return to management	-6,940	-8,987	-12,592

Table 6. Income and expense summary for typical ranches using net 1960 cattle prices, 1960

Item	Size of ranch		
	Small	Medium	Large
Receipts:			
Cattle sales	3,731	11,110	21,726
Crop sales	1,589	1,525	3,789
Total ranch income	5,320	12,635	25,515
Expenses:			
Cash costs	3,513	6,540	14,217
Non-cash costs	1,641	3,066	4,515
Total operating expense	5,154	9,606	18,732
Net ranch income:	166	3,029	6,783
Operator and family labor	3,800	4,950	6,200
Interest on investment	3,005	6,199	11,355
Return to management	-6,639	-8,120	-10,772

and 18 percent, respectively, of the receipts on medium and large ranches were from this source.

Cash costs constituted a larger percentage of total costs on the large ranch than on the medium or small ranches.

Comparative summary

Of the typical ranches, the small size got the most production per cow. This was expected since it sold a larger percentage of its calf crop as yearlings than did the medium or large ranch. Beef production per animal unit on the small ranch, however, was lower than on the other ranches because a larger percentage of the total herd were replacements and young stock (Table 7).

Gross ranch income per cow relative to beef sales per cow reflected the influence of crop sales on the ranch income. Crop production was much more important on the small ranch than on the medium or large ranch.

Expenses as well as income per cow were larger on the small ranch. Although it got the most production per cow, this production was more than offset by the costs. Medium and large ranches, while having lower rates of production, through more efficient use of their facilities, were able to produce at a much lower cost per unit and were making positive net returns per cow.

Using 1960 prices, net income per cow was $3 for the small ranch, $20 for the medium ranch, and $23 for the large ranch (Table 8).

Table 7. Comparative summary for typical ranches using net projected cattle prices for calculating the value of beef sales, 1960

Item	Unit	Average per animal unit 1/			Average per breeding cow		
		Small ranch	Medium ranch	Large ranch	Small ranch	Medium ranch	Large ranch
Annual beef production	Pounds	248	265	254	416	411	387
Annual beef sales	Dollars	41	44	43	69	68	66
Gross ranch income	Dollars	60	51	52	100	78	79
Costs:							
Cash	Dollars	42	28	31	70	44	47
Non-cash	Dollars	20	13	10	33	20	15
Total	Dollars	61	42	41	103	64	62
Net ranch income	Dollars	-2	9	11	-3	14	17
Return to operator's management	Dollars	-83	-39	-27	-139	-60	-42

1/ The small ranch has 87 animal units, the medium 236, and the large 466 animal units.

Basis for calculation of animal units:

Cows	1	animal unit
Heifers (coming 2 years) . .	.8	" "
Steers & heifers (coming 1 yr.)	.6	" "
Calves under 6 months . . .	.4	" "
Bulls	1.25	" "
Horses	1.5	" "

Horses were not included in the animal units used to calculate the averages above.

Table 8. Comparative summary for typical ranches using net 1960 cattle prices, 1960

Item	Unit	Average per animal unit 1/			Average per breeding cow		
		87 animal	236 animal	466 animal	87 animal	236 animal	466 animal
Annual beef production	Lbs.	248	265	254	416	411	387
Annual beef sales	Dollars	44	48	47	75	74	72
Gross ranch income	Dollars	63	54	56	106	84	85
Costs:							
Cash	Dollars	43	29	31	72	45	47
Non-cash	Dollars	20	13	10	33	20	15
Total	Dollars	63	42	41	105	65	62
Net ranch income	Dollars	2	13	15	3	20	23
Return to operator's management	Dollars	-79	-35	-23	-133	-54	-36

1/ Basing ranch size on animal units (AU) of livestock, the small ranch is an 87 AU ranch, the medium a 236 AU ranch, and the large size a 466 AU ranch

FEE ADJUSTMENTS

Four alternative levels of fees for BLM and Forest Service permits were budgeted through on the typical ranches (Appendix Tables 36, 37, and 38). The impact on costs and income was limited to changes in actual fee expenses, interest on cash costs, and net income. Gross income did not change.

The degree of the impact on costs was reflected in the relative importance of fees to total cash costs before and after the budgets were made (Table 9).

Table 9. Fee costs as a percentage of total cash costs at alternative levels of fees

	Level of fees (dollars/AUM)				
BLM fees	.20	.40	.60	.80	1.00
Forest Service fees	.60	.80	1.00	1.20	1.40
	(percent)	(percent)	(percent)	(percent)	(percent)
Small ranch	5	7	9	12	14
Medium ranch	8	12	16	20	23
Large ranch	7	11	14	18	21

Although of little significance initially, fees became a major expense item at higher levels. Effects on net income were of no small consequence. Based on projected net prices, a 68 percent decrease on the medium ranch and a 52 percent decrease on the large ranch resulted.

When 1960 net prices were used, the decrease was 47 percent on the medium ranch and 38 percent on the large ranch. Raising fees had less impact on net ranch income at the higher cattle prices (Table 10).

Table 10. Net income on typical ranches with alternative fee levels and variable cattle prices, 1960

	Level of fees (dollars/AUM)				
BLM fees	.20	.40	.60	.80	1.00
Forest Service fees	.60	.80	1.00	1.20	1.40
Small ranch					
Projected prices	-135	-232	-328	-424	-519
1960 prices	166	69	- 27	-123	-218
Medium ranch					
Projected prices	2169	1825	1488	1151	815
1960 prices	3029	2692	2355	2018	1682
Large ranch					
Projected prices	4963	4312	3661	3010	2359
1960 prices	6783	6132	5481	4380	4179

PERMIT ADJUSTMENTS

Adjustments in permitted AUM's may be made by reducing the number of livestock permitted, by reducing the grazing period, or by a combined adjustment in time and numbers.

Reduction in numbers

When a 20 percent reduction in permitted AUM's was instituted and the reduction was made in numbers of livestock allowed on the range, the influence each alternative adjustment to this reduction had on costs and revenues determined the degree of acceptability of that alternative (Appendix Tables 39, 40, 41).

In the short run, possible adjustments to a cut in permits were: (a) reduce the herd size; (b) purchase feed; (c) lease land; (d) change the use of owned land (Tables 11, 12).

Large and medium ranches had similar reactions to these alternatives, while those of the small ranches were different. Differences in internal ranch structure accounted for the various reactions.

Any deviation from the initial ranching program was detrimental to the medium and large ranches. With the existing level of management and technology Federal ranges provided the cheapest source of feed available to them. Two alternatives were better for the small ranch; both emphasized crop sales.

Reducing the herd size was best for the medium ranch and second best for the small and large ranches. Because of fixed costs, as herd

Table 11. Order of desirability of alternative adjustments to a reduction in permitted AUM's, based on available net ranch income

Ranch size	Alternative adjustments			
	Reduce herd size	Purchase feed	Lease land	Change cropping program
Small	2nd	4th	3rd	1st
Medium	1st	4th	2nd	3rd
Large	2nd	4th	1st	3rd

Table 12. Net ranch income with alternative adjustments to a reduction in permitted AUM's, based on projected net cattle prices[1/]

Ranch size	Alternative adjustments				
	Before 20% reduction	Reduce herd size	Purchase feed	Lease land	Change cropping program
	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
Small	-135	-48	-682	-328	170
Medium	2157	1612	-130	1478	456
Large	4963	3370	1061	3629	1862

1/ Taken from Appendix Tables 39, 40, and 41.

size decreased, costs per unit increased, making this less desirable than the initial program. An interesting adjustment took place on the small ranch relative to this alternative. As herd size decreased, net losses decreased also. This may be attributed in part to the influence of the crop enterprise on the ranch operation and in part to the relative magnitude of the product prices. It would probably pay the small rancher to reduce his herd and increase crop sales until all crops produced are sold and his owned range and pasture and public grazing permits can fully support his herd.

Purchasing feed which included hay, grain, or concentrates, was the least desirable method of adjusting to a reduction in permits. It was the most expensive alternative and since total revenue did not change but costs increased considerably, a substantial decrease in net revenue resulted.

Leasing land was best for the large ranch and the second and third best alternative for the medium and small ranches, respectively.

In budgeting through a change in the use of owned land, the same adjustment was made on all three ranches. The cropping program was altered so one-fifth of the cropland was in grain and the rest in alfalfa. With existing prices and yields, hay production was the more profitable enterprise. The change in the cropping pattern increased the production and sales of hay which in turn increased net income from crops. For the small ranch this proved to be the best adjustment to a reduction in permits.

Effects of variable pricing. With net October 1960 livestock prices, there was no change in the comparative desirability of the adjustments

to a reduction in permitted AUM's (Table 13). However, the degree of acceptability of the adjustments did change. There was less inclination to reduce the number of livestock on the ranches and variation in the effects on net income of the alternatives becomes smaller.

Table 13. Net ranch income with alternative adjustments to a reduction in permitted AUM's, based on net 1960 cattle prices

Ranch size	Alternative adjustments				
	Before 20% reduction	Reduce herd size	Purchase feed	Lease land	Change cropping program
	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
Small	166	201	381	- 27	471
Medium	3029	2382	997	2345	1323
Large	6783	4901	2881	5449	3682

Reduction in grazing time

If a reduction in permitted AUM's was made in time, there was no gain made by selling cattle. The necessary adjustment was simply one of finding other sources of feed for the period of time they had been cut off the public range. The impact on costs and revenues when the alternative adjustments were budgeted through would be no different than if the cut had been taken in number of livestock permitted.

Simultaneous cuts in permitted AUM'S and increases in fees

Increasing fees and reducing permitted AUM'S at the same time had a magnified effect on net ranch income (Appendix Tables 42, 43).

With net projected livestock prices, the small ranch, by selling cattle, could maintain an income comparable to that of the initial program through one increase in fees. By changing the use of its owned land, the small ranch could absorb three increases in fees without suffering greater losses in net income.

Using net 1960 cattle prices, selling livestock would not maintain net income through one fee increase. However, changing the use of owned land more than supported a net income comparable with the original through three increases in fees.

There were 25 possible net revenues for each ranch when all combinations of fee levels and adjustments to a reduction in permitted AUM's were budgeted through. With the exception of those mentioned in the previous paragraphs, all the combinations would have a depressing effect on net income.

SUMMARY AND CONCLUSIONS

The purpose of this study has been to determine the effect of cutting grazing permits and increasing grazing fees on net income of Utah cattle ranches which use public range for grazing the year around.

Fee expenses were a relatively small percentage of the cash costs on the typical ranches studied. Small increases in fees changed the ranch financial picture very little, however, as the value of the fees increased they became more important relative to other cash costs until at the higher levels they were one of the major cost items.

The effects of a reduction in permitted AUM's varied with the ranch size, its internal structure, and the type of adjustments made to offset the permit reduction. If each ranch used the best of the alternatives available to adjust to a reduction in AUM's, the economic status of the ranch would change little.

The typical small ranch was actually better off when its permits were cut, providing the adjustments to the reduction were made by selling cattle or altering the cropping pattern on the owned land. Purchasing feed or leasing land would be more expensive but the increase in costs would be small.

Any reduction in AUM's would have an adverse financial effect on the typical medium and large ranches. Leasing land would be the most favorable adjustment on the large ranch while reducing the herd size would be best for the medium ranch. Reorganizing the use of owned land on these ranches had little positive effect with the existing

level of management and technology. Utah cattle ranches were losing substantial sums of money on a per cow basis when all costs were included. Raising fees and cutting permitted AUM's would accentuate the problem, the degree would be directly associated with the magnitude of the change in fees and permitted AUM s.

This study has been limited to the short run effects on ranch income of raising fees and cutting permits with management and technology held constant. More research needs to be done on possible long run adjustments open to ranchers. Also, an evaluation of the effect of various levels of management and technology on the economic well being of Utah cattle ranches would be helpful.

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APPENDIX

Table 14. Permitted AUM's on BLM and forest range in Utah for years 1951 to 1959

Year	BLM permitted AUM's	Forest Service permitted AUM's
1951	2,592,735	538,641
1952	2,576,119	530,611
1953	2,586,695	522,353
1954	2,537,911	515,603
1955	2,471,856	511,140
1956	2,452,849	489,423
1957	2,414,023	474,131
1958	2,414,023	474,131
1958	2,339,724	470,038
1959	2,333,595	455,796

Source: Bureau of Land Management and Forest Service Annual Reports, 1915 to 1959.

Table 15. Feed availability and consumption on typical small ranch, 1960

	Forest range (AUM's)	BLM range (AUM's)	Private meadow (AUM'S)	Private range (AUM's)	After-math (AUM's)	Hay (ton)	Grain (ton)	Protein supple-ment (ton)
Cows	188	190	12	31	50	38.5	3.4	1.25
Calves				58	14	12.8		
Steers, yearling			78					
Replacements		44		81	6			
Bulls	10	5			3	4.9		
Horses			12			3.9		
Total con-sumed	198	241	101	170	73	60	3.4	1.25
Total available	198	241	101	170	73	90	2.5	1.25
Total unused	0	0	0	0	0	30	21.6	0

Table 16. Feed availability and consumption on typical medium ranch, 1960

	Feeds available and consumed							
	Forest	BLM	After-math	Private meadow	Private range	Hay	Grain	Protein supple-ment
	(AUM's)	(AUM's)	(AUM's)	(AUM's)	(AUM's)	(ton)	(ton)	(ton)
Cows	505	859	62.5		159	72	8.4	2.12
Calves		69	14.0			34.5		
Replacements		69	12.5	77	34	28.0	2.53	
Yearling steers				64				
Bulls	25	8	3.5		7	6.5	.8	
Horses			6.75	18	200	4.8		
Units consumed	530	1005	100	160		146.0	12.0	2.12
Units available	530	1005	100	160	200	165	45	2.12
Units unused	0	0	0	0	0	19	33	0

Table 17. Feed availability and consumption on typical large ranch, 1960

	Forest range	BLM range	Private and leased range	After-math	Private meadow	Hay	Grain	Protein supple-ment
	(AUM's)	(AUM's)	(AUM's)	(AUM's)	(AUM's)	(ton)	(ton)	(ton)
Cows	775	2007	430			137.9	26.5	9.37
Calves			78.3	100		39.1	6.6	
Steers, yearling					156			
Replace-ments		116.0	97.0	100	288.0			
Bulls	50		80.6		15	21	2.2	
Horses					6.0	6		
Total con-sumed	825	2123	686.0	200	525.0	204	36	9.5
Total avail-able	825	2123	676.0	200	525	300	75	9.5
Excess	0	0	0	0	0	96	39	0

Table 18. Livestock inventory and investment for typical small, medium, and large ranches, 1960

Class of livestock	Ranch size: Small		Medium		Large	
	Avg. inventory	Investment	Avg. inventory	Investment	Avg. inventory	Investment
	(number)	(dollars)	(number)	(dollars)	(number)	(dollars)
Cattle:						
Cows[1/]	50	6,250	150	18,750	300	35,700
Bulls	2	450	6	1,350	15	3,375
Yearling heifers	11	1,364	25	3,100	45	5,580
Heifer calves	12	912	26	1,976	50	3,800
Steer calves	12	864	20	1,440	37	2,664
Sub-total	XXX	9,840	XXX	26,616	XXX	51,119
Horses:						
Saddle	2	170	3	255	5	425
Sub-total	XXX	170	XXX	255	XXX	425
Total investment	XXX	10,010	XXX	26,871	XXX	51,544

1/ 2 years old and over.

The inventory values of cows, yearlings, and calves are based on the 1960 market price at the ranch.

The inventory value of bulls and horses is the market value plus the salvage value divided by 2.

Table 19. Land inventories for typical small, medium, and large ranches, 1960

Class of land	Size of ranch					
	Small		Medium		Large	
	Owned	Leased	Owned	Leased	Owned	Leased
	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Irrigated land:						
Native and improved meadow	90		160		420	
Alfalfa	30		55		100	
Barley	20		30		60	
Rangeland leased or owned:						
Non-Federal	400		800		750	1128
Totals	540		1045		1330	1128
Federal Range Permits:1/ Permits:1/	(animal months)		(animal months)		(animal months)	
Bureau of Land Management	268		1105		2335	
Forest Service	198		530		825	

1/ Federal range use is calculated on the basis of animal months for all animals over six months of age and does not correspond to AUM's calculated from feeding standards.

Table 20. Investment in buildings and improvements for typical small ranch, 1960

Class of improvement	Description	Number (No.)	Average investment (dollars)
Livestock facilities:			
Sheds	Pole frame, all wood, dirt floor 20'x100'	1	757
Corrals	Pole 700' around	2	155
Feed	Manger 128' long, wood	1	121
Other	Feed troughs	3	
Watering facilities:			
Stock water	Troughs 100 gal., metal	1	9
	Well 100', 4" casing	1	252
	Pump, electric	1	126
Crop facilities:			
Granaries	Frame 12' x 14' x 10	1	328
Stackyard	50'x100' 5 strand barb wire	1	25
Fences:			
Boundary	4 strad barb	2 mi.	533
Cross	4 strand barb	1 mi.	266
Total investment:			2,572

Note: Annual costs are: depreciation $259, repairs $148.

Table 21. Investment in buildings and improvements for typical medium ranch, 1960

Class of improvement	Description	Number	Average investment
		(No.)	(dollars)
Livestock facilities:			
Sheds	Frame, pole, dirt floor 24' x 80'	1	727
Corrals	Pole 1300'	2	289
Feed	Manger, lumber, 400'	1	380
Other	Troughs, lumber	8	121
Watering facilities:			
Stock water	Troughs 89 gal., metal	2	18
	Well 150' 4" casing	1	378
	Pump, electric	1	126
Crop facilities:			
Granaries	Metal, 1500 bu.	1	378
Stackyard	50'x100' 5 wire	4	101
Other facilities:			
Machine sheds	Frame 26' x 60'	1	1182
Shop	Frame 220' x 30'	1	1060
Fences:			
Boundary	Barb 5 wire	5 mi.	1500
Cross	Barb 5 wire	2 mi.	600
Total investment			6860

Note: Annual costs are: depreciation $847, repairs $388.

Table 22. Investment in buildings and improvements for typical large ranch, 1960

Class of improvement	Description	Number	Average investment
		(No.)	(dollars)
Livestock facilities:			
Sheds	Frame, tin roof 20'x100' dirt floor	1	757
Corrals	Pole, 2300' of fence	3	510
Feed	Manger 640', rough lumber	1	607
Watering facilities:			
Stock water	Troughs 98 gal. metal	4	36
	Well 150' 4" casing	1	378
	Pump, electric	1	126
Crop facilities:			
Granaries	Tin, 1000 bu. each	2	416
Stackyards	50'x100' 5 wire	2	36
Other facilities:			
Machine sheds	Frame, tin roof 24'x100'	1	1818
Shop	Frame, 20'x30'	1	1060
Fences:			
Boundary	5 wire	10 mi.	3000
Cross	5 wire	8 mi.	2400
Total investment			11,144

Note: Annual costs are: depreciation $1,167, repairs $704.

Table 23. Investment in machinery and equipment for typical small ranch, 1960

Item	Description	Number	Average investment
		(No.)	(dollars)
Tractors	30 hp	1	1,372
Trucks	$1\frac{1}{2}$ ton	1	1,717
Pickup	3/4 ton	1	1,111
Auto (ranch share)	$\frac{1}{2}$ car value		660
Haying equipment			1,709
Tillage equipment			174
Other crop equipment			411
Livestock equipment			209
Shop equipment and small tools			55
Other			62
Total investment			7,480

Table 24. Investment in machinery and equipment for typical medium ranch, 1960

Item	Description	Number	Average investment
		(No.)	(dollars)
Tractors		2	2,595
Trucks		2	2,878
Auto (ranch share)	1/2 value	1	660
Haying equipment			1,706
Tillage equipment			399
Other crop equipment			411
Livestock equipment			500
Shop equipment and small tools			134
Others			86
Total investment			9,369

Note: Annual costs are: depreciation $1,343, repairs $910, operating costs $1,097.

Table 25. Investment in machinery and equipment for a typical large ranch, 1960

Item	Description	Number	Average investment
		(No.)	(dollars)
Tractors		2	3,198
Trucks		2	2,828
Auto (ranch share)	1/2 value	1	660
Haying equipment			2,225
Tillage equipment			694
Other crop equipment			645
Livestock equipment			669
Shop equipment and small tools			148
Others			172
Total investment			11,239

Note: Annual costs are: depreciation $1,618, repairs $1,306, operating costs $1,406.

Table 26. Labor use and costs for typical small ranch, 1960

Worker	Number	Labor used	Wage rate2/	Total cost2/
	(No.)	(man-months)	($/unit)	(dollars)
Family:				
Operator1/	1	8	350	2,800
Unpaid family workers1/	1	4	250	1,000
Sub-total		12		3,800
Hired:				
Day-laborers	1	.5	240	124
Totals		12.5		3,924

1/ Operator and unpaid family labor charged for at the same rate as equivalent hired workers.

2/ Cash wage rate. Board and room values accounted for elsewhere.

3/ Including costs of social security and workman's compensation insurance payments.

Table 27. Labor use and costs for typical medium ranch, 1960

Worker	Number	Labor used	Wage rate[2]	Total cost[3]
	(No.)	man-months	($/unit)	(dollars)
Family:				
Operator[1]	1	12	350	4,200
Unpaid family workers[1]	1	3	250	750
Sub-total		15		4,950
Hired:				
Day-laborers	2	1.2	240	302
Totals		17.2		5,252

1/ Operator and unpaid family labor charged for at the same rate as equivalent hired workers.

2/ Cash wage rate. Board and room values accounted for elsewhere.

3/ Including costs of social security and workman's compensation insurance payments.

Table 28. Labor use and costs for typical large ranch, 1960

Worker	Number	Labor used	Wage rate 2/	Total cost 3/
	(No.)	(man-months)	($/unit)	(dollars)
Family:				
Operator 1/	1	12	350	4,200
Unpaid family workers 1/	2	8	250	2,000
Sub-total		20		6,200
Hired:				
Full-time workers	1	8	350	2,926
Totals		28		9,126

1/ Operator and unpaid family labor charged for at the same rate as equivalent hired workers.

2/ Cash wage rate. Board and room values accounted for elsewhere.

3/ Including costs of social security and workman's compensation insurance payments.

Table 29. Forage and feed use and costs for typical small ranch, 1960

Kind of feed	Unit	Total amount fed	Purchases		
			Amount	Price	Cost
		(unit)	(unit)	($/unit)	(dollars)
Alfalfa hay	Ton	60			
Barley	Cwt.	68			
Protein supplenents	Cwt.	25	25	4.04	101
Salt	Cwt.	26	26	1.31	34
Total purchased feeds					135
Owned land:					
Irrigated pasture	AUM	102			
Rangeland	AUM	73			
Aftermath grazing	AUM	197			
Sub-total	AUM	372			
Federal Range Permits:					
Bureau of Land Management	AUM	268	268	.20	54
Forest Service	AUM	198	198	.60	119
Sub-total	AUM	466	466		173
Total, Range and Pasture	AUM	838	466		173

Table 30. Range and feed use and costs for typical medium ranch, 1960

Kind of feed	Unit	Total amount fed	Purchases		
			Amount	Price	Cost
		(unit)	(unit)	($/unit)	(dollars)
Alfalfa hay	Ton	146			
Feed grains	Cwt.	234.6			
Protein supplements	Cwt.	42.5	42.5	4.04	172
Salt	Cwt.	68.1	68.1	1.31	89
Total purchased feeds					261
Owned land:					
Irrigated pasture	AUM	160			
Rangeland	AUM	200			
Aftermath grazing	AUM	100			
Sub-total	AUM	460			
Federal Range Permits:					
Bureau of Land Management	AUM	1105	1105	.20	221
Forest Service	AUM	530	530	.60	318
Sub-total	AUM	1635	1635		539
Total, Range and Pasture	AUM	2095			539

Table 31. Forage and feed use and costs for typical large ranch, 1960

Kind of feed	Unit	Total amount fed (unit)	Purchases Amount (unit)	Price (R/unit)	Cost (dollars)
Alfalfa hay	Ton	204			
Feed grains	Cwt.	720			
Protein supplements	Cwt.	190	190	4.04	768
Salt	Cwt.	123	123	1.31	161
Total, purchased feeds					929
Owned land:					
Irrigated pasture	AUM	525			
Rangeland	AUM	300			
Aftermath grazing	AUM	200			
Sub-total	AUM	1,025			
Leased land:					
Rangeland	AUM	376	376	.50	188
Federal Range Permits:					
Bureau of Land Management	AUM	2,335	2,335	.20	467
Forest Service	AUM	825	825	.60	495
Sub-total	AUM	3,160	3,160		962
Total, Range and Pasture	AUM	4,561			1,150

Table 32. Crop production and sales for typical small, medium, and large ranches, 1960

Ranch size	Crop	Unit	Acres	Average yield (units)	Total production (units)	Sales (units)	Price[1/] (dollars)	Value of sales (dollars)
	Alfalfa	Ton	30	3	90	30	22	660
Small	Barley	Cwt.	20	25	500	432	2.15	929
	Total sales							1589
	Alfalfa	Ton	55	3	165	19	22	418
Medium	Barley	Cwt.	30	25	750	515	2.15	1107
	Total sales							1525
	Alfalfa	Ton	100	3	300	96	22	2112
Large	Barley	Cwt.	60	25	1500	780	2.15	1677
	Total sales							3789

1/ These are 1961 prices adjusted to reflect 1960 price conditions.

Table 33. Production and sale of cattle on typical small, medium, and large ranches based on net projected prices, 1960[1]

Ranch size	Class of cattle	Number sold	Average weight	Total weight	Average price	Total value of sales
		(number)	(pounds)	(cwt.)	($/cwt.)	(dollars)
	Cows	7	1000	70	11.60	812
Small	Heifer calves	9	380	34	18.35	624
	Steer calves	8	400	32	20.00	640
	Yearling steers	12	600	72	18.80	1,354
	Total sales					3,430
	Cows	21	1000	210	11.80	2,478
	Heifer calves	35	380	133	18.40	2,447
Medium	Steer calves	41	400	164	20.05	3,288
	Yearling steers	18	600	108	18.80	2,030
	Total sales					10,234
	Cows	34	950	323	11.80	3,811
	Heifer calves	73	380	277	18.40	5,104
Large	Steer calves	85	400	340	20.05	6,817
	Yearling steers	37	600	222	18.80	4,174
	Total sales					19,906

1/ The prices are USDA projected Omaha prices adjusted to Ogden prices and then adjusted for seasonal variation and marketing costs so they would reflect the price of cattle at the farm level.

Table 34. Production and sale of cattle based on net 1960 prices[1/] for typical small, medium, and large ranches, 1960

Class of cattle	Ranch size: Small			Medium			Large		
	Avg. price	Total wt.	Value of sales	Avg. price	Total wt.	Value of sales	Avg. price	Total wt.	Value of sales
	($/cwt)	(cwt)	(dollars)	($/cwt)	(cwt)	(dollars)	($/cwt)	(cwt)	(dollars)
Cows	11.45	70	801	11.65	210	2,446	11.65	323	3,763
Heifer calves	19.62	34	667	19.64	133	2,612	19.65	277	5,451
Steer calves	22.87	32	732	22.89	164	3,754	22.90	340	7,786
Yearling steers	21.27	72	1,531	21.28	108	2,298	21.29	222	4,726
Total sales			3,731			11,110			21,726

1/ Prices at the Ogden market in October, 1960, net of transportation and marketing charges to reflect the on-farm price of cattle at that time.

Table 35. Costs and expenses of operating typical small, medium, and large ranches, 1960

Item	Size of ranch		
	Small	Medium	Large
	(dollars)	(dollars)	(dollars)
Cash costs:			
Grazing fees:			
Bureau of Land Management	54	221	467
Forest Service	119	318	495
Land and pasture rent			188
Labor hired	124	302	2,926
Feed purchased	135	261	929
Repairs and maintenance:			
Building & improvements	148	388	704
Machinery and equipment	781	910	1,306
Veterinary services & supplies	35	50	372
Taxes:			
Cattle	93	244	483
All other property	516	901	1,734
Seed and fertilizer	200	500	950
Machine operating costs	530	1,097	1,406
Machine hire	175	262	525
Insurance	86	113	113
Utilities[1/]	35	240	339
Irrigation water	190	330	740

Table 35. (cont'd.)

Item	Size of ranch		
	Small	Medium	Large
	(dollars)	(dollars)	(dollars)
Miscellaneous 2/	292	403	540
Total cash costs	3,513	6,539	14,217
Non-cash costs:			
Depreciation:			
Buildings & improvements	259	847	1,167
Machinery & equipment	1,087	1,343	1,618
Bulls 3/	150	619	1,204
Horses 3/	40	60	100
Interest on cash costs	105	198	426
Total non-cash costs	1,641	3,067	4,515
Total operating costs	5,154	9,606	18,732
Operator and family labor	3,800	4,950	6,200
Interest on investment	3,005	6,199	11,355
Total ranch costs and expenses	11,959	20,755	36,287

1/ Includes electricity, telephone, gas, and domestic water.
2/ Miscellaneous costs include twine.
3/ Includes bull and horse death losses. Death loss costs are shown here to incorporate these costs without showing one-tenth, or some other fraction of an animal dying. Average death loss is 5 percent of average investment.

Table 36. Effects of grazing fee adjustments on costs and income for typical small ranch, 1960

Item	Level of fee (dollars/AUM)				
BLM fee	$0.20	$0.40	$0.60	$0.80	$1.00
Forest Service fee	$0.60	$0.80	$1.00	$1.20	$1.40
	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
Receipts:					
Cattle sales	3,430	3,430	3,430	3,430	3,430
Crop sales	1,589	1,589	1,589	1,589	1,589
Total ranch income	5,019	5,019	5,019	5,019	5,019
Expenses:					
Cash costs	3,513	3,607	3,700	3,793	3,886
Non-cash costs	1,641	1,644	1,647	1,650	1,652
Total operating expenses 1/	5,154	5,251	5,347	5,443	5,538
Net ranch income	- 135	- 232	- 328	- 424	- 519
Operator and family labor	3,800	3,800	3,800	3,800	3,800
Interest on investment	3,005	3,005	3,005	3,005	3,005
Return to management	-6,940	-7,037	-7,133	-7,229	-7,324
1/ Percent fees are of total operating expenses	3.3	5.1	6.7	8.3	9.8

Table 37. Effects of grazing fee adjustments on costs and income for typical medium ranch, 1960

Item	Level of fee (dollars/AUM)				
BLM fee	$0.20	$0.40	$0.60	$0.80	$1.00
Forest Service fee	$0.60	$0.80	$1.00	$1.20	$1.40
	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
Receipts:					
Cattle sales	10,243	10,243	10,243	10,243	10,243
Crop sales	1,525	1,525	1,525	1,525	1,525
Total ranch income	11,768	11,768	11,768	11,768	11,768
Expenses:					
Cash costs	6,540	6,867	7,194	7,521	7,848
Non-cash costs	3,066	3,076	3,086	3,096	3,105
Total operating expenses 1/	9,606	9,943	10,280	10,617	10,953
Net ranch income	2,162	1,825	1,488	1,151	815
Operator and family labor	4,950	4,950	4,950	4,950	4,950
Interest on investment	6,199	6,199	6,199	6,199	6,199
Return to management	-8,987	-9,324	-9,661	-9,998	-10,334
1/ Percent fees are of total operating expenses	5.6	8.7	11.6	14.3	16.9

Table 38. Effects of grazing fee adjustments on costs and income for a typical large ranch, 1960

Item	Level of fee (dollars/AUM)				
BLM fee	$0.20	$0.40	$0.60	$0.80	$1.00
Forest Service fee	$0.60	$0.80	$1.00	$1.20	$1.40
	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
Receipts:					
Cattle sales	19,906	19,906	19,906	19,906	19,906
Crop sales	3,789	3,789	3,789	3,789	3,789
Total ranch income	23,695	23,695	23,695	23,695	23,695
Expenses:					
Cash costs	14,217	14,849	15,481	16,113	16,745
Non-cash costs	4,515	4,534	4,553	4,572	4,591
Total operating expenses 1/	18,732	19,383	20,034	20,685	21,336
Net ranch income	4,963	4,312	3,661	3,010	2,359
Operator and family labor	6,200	6,200	6,200	6,200	6,200
Interest on investment	11,355	11,355	11,355	11,355	11,355
Return to management	-12,592	-13,243	-13,894	-14,545	-15,196
1/ Percent fees are of total operating expenses	5.1	8.2	11.1	13.8	16.4

Table 39. Summary of effects of a 20 percent reduction in actual use of the Federal range for typical small ranch, 1960

		After 20% reduction			
		After change in ranch organ. & oper.			
Item	Before 20% reduction	Reducing the breeding herd	Purchasing more feed	Leasing more land	Changing use of owned land
	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
Receipts:					
Cattle sales	3,430	2,793	3,430	3,430	3,430
Crop sales	1,589	2,205	1,008	1,589	1,790
Total ranch income	5,019	4,998	4,438	5,019	5,220
Expenses:					
Cash costs	3,513	3,409	3,480	3,700	3,421
Non-cash costs	1,641	1,637	1,640	1,647	1,638
Total operating expenses	5,154	5,046	5,120	5,347	5,050
Net ranch income:	- 135	- 48	- 682	- 328	170
Operator and family labor	3,800	3,800	3,800	3,800	3,800
Interest on investment	3,005	2,841	2,946	2,946	2,946
Return to management	-6,940	-6,689	-7,428	-7,074	-6,576

Table 40. Summary of effects of a 20 percent reduction in actual use of the Federal range for typical medium ranch, 1960

Item	Before 20% reduction	After 20% reduction: After change in ranch organ. & oper.: Reducing the breeding herd	Purchasing more feed	Leasing more land	Changing use of owned land
	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
Receipts:					
Cattle sales	10,243	8,739	10,243	10,243	10,243
Crop sales	1,520	2,204	1,058	1,520	242
Total ranch income	11,763	10,943	11,301	11,763	10,485
Expenses:					
Cash costs	6,540	6,373	8,059	7,199	6,951
Non-cash costs	3,066	2,958	3,112	3,086	3,078
Total operating expenses	9,606	9,331	11,171	10,285	10,029
Net ranch income:	2,157	1,612	130	1,478	456
Operator and family labor	4,950	4,950	4,950	4,950	4,950
Interest on investment	6,199	5,789	6,014	6,014	6,014
Return to management	-8,992	-9,127	-10,834	-9,486	-10,508

Table 41. Summary of effects of a 20 percent reduction in actual use of the Federal range for a typical large ranch, 1960

Item	Before 20% reduction	After 20% reduction: After change in ranch organ. & oper.: Reducing the breeding herd	Purchasing more feed	Leasing more land	Changing use of owned land
	(dollars)	(dollars)	(dollars)	(dollars)	(dollars)
Receipts:					
Cattle sales	19,906	16,787	19,906	19,906	19,906
Crop sales	3,789	4,806	973	3,789	1,157
Total ranch income	23,695	21,593	20,879	23,695	21,063
Expenses:					
Cash costs	14,217	13,876	15,271	15,512	14,672
Non-cash costs	4,515	4,347	4,547	4,554	4,529
Total operating expenses	18,732	18,223	19,818	20,066	19,201
Net ranch income:	4,963	3,370	1,061	3,629	1,862
Operator and family labor	6,200	6,200	6,200	6,200	6,200
Interest on investment	11,355	10,609	11,020	11,020	11,020
Return to management	-12,592	-13,439	-16,159	-13,591	-15,358

Table 42. Effect on net income of a simultaneous reduction in permitted AUM's and increases in fees when 1960 net cattle prices are used, 1960

Ranch size	Alternative fee levels BLM	Alternative fee levels FS	Alternative adjustments to a reduction in AUM's: Before 20% reduction (dollars)	Reduce herd (dollars)	Purchase feed (dollars)	Lease land (dollars)	Change cropping program (dollars)
	.20	.60	166	201	381	-27	471
	.40	.80	69	104	284	-124	374
Small	.60	1.00	-27	8	188	-220	278
	.80	1.20	-123	-88	92	-316	182
	1.00	1.40	-218	-183	-3	-411	87
	.20	.60	3029	2382	997	2345	1323
	.40	.80	2692	2045	660	2008	986
Medium	.60	1.00	2355	1708	323	1671	649
	.80	1.20	2018	1371	-14	1334	312
	1.00	1.40	1682	1035	-350	998	-24
	.20	.60	6783	4901	2881	5449	3682
	.40	.80	6128	4246	2226	4794	3027
Large	.60	1.00	5481	3599	1579	4147	2380
	.80	1.20	4830	2948	928	3496	1729
	1.00	1.40	4179	2297	277	2845	1078

Table 43. Effect on net income of a simultaneous reduction in permitted AUM's and increases in fees when net projected cattle prices are used, 1960

Ranch size	Alternative fee levels BLM	Alternative fee levels FS	Alternative adjustments to a reduction in AUM's: Before 20% reduction (dollars)	Reduce herd (dollars)	Purchase feed (dollars)	Lease land (dollars)	Change cropping program (dollars)
	.20	.60	-135	-48	-682	-328	170
	.40	.80	-232	-145	-779	-425	73
Small	.60	1.00	-328	-241	-875	-521	-23
	.80	1.20	-424	-337	-971	-617	-119
	1.00	1.40	-519	-432	-1066	-712	-214
	.20	.60	2157	1612	130	1478	456
	.40	.80	1820	1275	-207	1141	119
Medium	.60	1.00	1483	938	-544	804	-218
	.80	1.20	1146	601	-881	467	-555
	1.00	1.40	810	265	-1217	131	-891
	.20	.60	4963	3370	1061	3629	1862
	.40	.80	4308	2715	406	2974	1207
Large	.60	1.00	3661	2068	-241	2327	560
	.80	1.20	3010	1417	-892	1676	-91
	1.00	1.40	2359	766	-1543	1025	-742