

EFFECT OF HANDLING CATTLE ON THE RANGE
ON WEIGHT GAINS

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There is increasing need for producing more livestock and other values from range lands. The yield of these values--recreation, wildlife, watershed, and timber as well as livestock--is determined to a large extent by livestock grazing. Intensive pasture management of ranges is essential for sustained, high-level production of all these values.

More handling of livestock is usually necessary under pasture grazing than under open range grazing. An important question raised by stockmen is: How can livestock be grazed on ranges under pasture conditions for best weight gains? Grazing trials have provided information on this question.

The results of three studies comparing weight gains of cattle under pasture rotation and continuous grazing are presented here. After studying each situation and before you read the results later in this paper, note the group or herd of cattle you think gained most weight during the season.

While you study each situation, bear in mind that as animals are moved about from pasture to pasture under rotation grazing, they are exposed to forage at different growth stages and nutritive values. Knowledge of the nutritive value of forage at different growth stages throughout the season is important in best handling of livestock.

Weight data on yearling heifers on a mountain bunchgrass range in California can be used to illustrate the general trend in nutritive value of forage through the season. In May on young growth consisting mainly of leafage and just tall enough to be grazed, the animals gained about 0.5 pounds per day. When flower stalks started to show above the basal leaves of the grasses, the animals gained 1.2 pounds. Just before flowering time, they gained 2.3 pounds--the seasonal maximum. At seed-ripe time early in August when the vegetation was about 40 percent dry, they still gained 2.0 pounds. And in mid-September when the vegetation was 80 percent dry, about 1.0 pound. Gains decreased during the next three weeks. About the end of the first week in October when the vegetation was practically dry and freezing weather had set in, the animals started to lose weight although they had plenty of forage to eat.

Study 1. (This study was reported by S. Smoliak in the September 1960 issue of the Journal of Range Management)

Gains of yearling steers under continuous and rotation grazing were measured for 9 years from 1949 to 1957 on shortgrass prairie range on the Northern Great Plains in Alberta, Canada. The main forage species were blue grama grass, needle-and-thread grass, Junegrass, and western wheatgrass. Average annual precipitation was 12 inches. The grazing season was 6 months long, from May 1 to October 27. Two 300-acre pastures were used. A herd of 16 yearling steers was grazed in each. The rotation pasture was divided into two equal parts with a fence.

Herd A was grazed continuously through the season in the undivided pasture. Herd B was grazed in one part of the rotation pasture for the first 1.5 months of the grazing season, then it was moved to the other part and grazed there for 3.0 months. Finally the animals were moved back again into the first part of the pasture for the last 1.5 months of the season. Grazing was started in one half of the pasture one year and the other half the next.

In the first move of cattle in the rotation pasture (on June 21), the animals were placed on ungrazed forage close to peak nutritive value. In the second move (on September 18), the animals were placed on forage that had been grazed-over in spring.

The animals in each pasture were weighed at the beginning and end of the grazing season and also at the time the rotated animals were moved. There was little or no difference in the handling of the two herds. The pastures were strictly comparable. They were stocked moderately, so there was ample forage for the animals at all times. Which herd gained the most weight during the season--Herd A under continuous grazing or Herd B under rotation grazing?

Study 2. (Unpublished results)

A study similar to Study 1 was conducted by the writer for 3 years, from 1945 to 1947, with yearling heifers on a mountain summer range in northeastern California. In this case the rotated animals were moved between two different range types--pine timber and meadow. The main forage species in the timber type were Idaho fescue, bottlebrush squirreltail, and needlegrasses--all bunchgrasses, and woolly wyethia, lupine, and bitterbrush. In the meadow type they were Nevada bluegrass and other grasses and a variety of sedges, rushes, and broad-leaf plants.

One timber pasture and two meadow pastures and 3 herds of 11 yearling heifers were used in the study. The grazing season was 139 days long, from May 14 to September 30.

Earlier studies had shown that yearling heifers gained somewhat more weight in the meadow type than in the timber type, and also that they gained faster in the timber type than in the meadow type for the first 2 or 3 weeks and also the last 5 or 6 weeks of the season. During the intervening summer period the animals gained faster in the meadow type. The present study was conducted to find out whether cattle that were moved from one type to another so as to take advantage of superior forage gained more or less weight than animals grazed continuously seasonlong in either of the two types.

Herd A was grazed continuously seasonlong in one of the meadow pastures and Herd B seasonlong in the timber pasture. Herd C was rotated between the timber pasture and the second meadow pasture. Herd C was grazed together with Herd B in the timber pasture from the start of the season until about June 15. At that time cattle on meadow type were gaining faster than cattle on timber type, so Herd C was moved to the meadow pasture. On August 25 when cattle were gaining faster on timber type, Herd C was moved back to the timber pasture.

There was adequate forage in the pastures for all three herds at all times. The animals were weighed every two weeks during the season.

Rate the three herds for seasonal weight gains using (1) to denote highest gains, (2) intermediate gains, and (3) lowest gains:

Herd A continuous meadow	_____
Herd B continuous timber	_____
Herd C rotation timber-meadow	_____

In 1948 the timber pasture was divided into East and West fields and the rotated herd was allowed to graze freely between the East timber field and the West meadow field which adjoined. The other timber and meadow fields were each grazed continuously with a group of cattle.

Rate the three herds for seasonal 1948 gains as in the 1945-1947 study:

Herd A continuous meadow	_____
Herd B continuous timber	_____
Herd C rotation (free grazing) timber-meadow	_____

Study 3. (Unpublished results)

The following information on weight gains of cows, calves, yearling heifers and yearling steers under continuous and rotation grazing was obtained by the writer on a 30,000-acre mountain summer range in northeastern California. The range encompasses pine timber, sagebrush, and meadow types.

The range was operated under a form of rotation grazing involving pastures averaging 6,000 acres in size. The grazing season was 4 months long, from June 1 to September 30.

In one grazing treatment on this range one group of cattle, Herd A, was grazed continuously in one pasture through the season. A second group of comparable cattle, Herd B, was grazed in the same pasture until seed of the principal forage plants on the range ripened (about August 1) then Herd B was moved to an ungrazed pasture. So rotation in this case consisted simply of moving animals between two pastures as described. The animals were moved a distance of about two miles over nearly flat ground.

Check the grazing treatment that produced the greatest gains in each class of animal:

Treatment	Cows	Calves	Yearling heifers	Yearling steers
A continuous grazing	_____	_____	_____	_____
B rotation grazing	_____	_____	_____	_____

Results of Studies

Study 1.

Animals in Herd A under continuous grazing gained 13.9 pounds per head more during the season than animals in Herd B under rotation grazing (Table 1). Herd A outgained Herd B in all years except one. Nearly 11 of the approximately 14 pounds difference in seasonal gains between the two herds developed during the second grazing period after the rotated animals were moved to the ungrazed pasture.

Table 1. Average daily and total seasonal gains of yearling steers under continuous and rotation grazing, 1949-1957.

	Average daily gain			Total seasonal gain
	1st period	2nd period	3rd period	
	----- Pounds -----			
Herd A-continuous	2.05	2.02	0.37	300.5
Herd B-rotation	<u>2.05</u>	<u>1.88</u>	<u>0.31</u>	<u>286.6</u>
Difference	0	.14	.06	13.9

Smoliak explained the reaction in this pasture as follows: It "contained more mature forage, which was lower in protein content, than the continuously grazed field during this period." The high protein content of the forage in the continuously grazed pasture was most likely due to regrowth. Abrupt change to a different kind of feed and to a different environment no doubt also contributed to the difference in gains.

There was no difference in gains during the first grazing period before rotation was started, showing that the two pastures were comparable.

Study 2.

1945-1947. Cattle grazed continuously in the timber and meadow pastures gained more weight than the cattle rotated between the two types. Cattle grazed in the meadow pasture gained 27 pounds more during the season than cattle that were rotated. Cattle grazed in the timber pasture gained 25 pounds more (Table 2). Cattle grazed continuously in the meadow pasture gained the most weight, but in these three years only an average of 2 pounds more than cattle grazed in the timber pasture.

Table 2. Total seasonal gains of cattle under continuous and rotation grazing.

Grazing treatment	1945	1946	1947	Ave.	1948
	- - - - - Pounds per head - - - - -				
Herd A-continuous meadow	221	229	238	229	230
Herd C-rotation timber-meadow	193	205	209	202	214
Herd B-continuous timber	224	231	226	227	207

1948. In this year the rotated cattle that grazed freely between a timber and a meadow pasture gained 7 pounds more than cattle grazed continuously in a timber pasture but 16 pounds less than those grazed in a meadow pasture. This intermediate gain is what could be reasonably expected in animals grazing freely in both timber and meadow types. Also in this year cattle in the meadow pasture gained 23 pounds more than cattle in the timber pasture.

Study 3.

In the case of all four classes of cattle, the animals that grazed continuously in one pasture gained more weight than the animals that were rotated, even though the rotation in this case involved but one move and the animals were placed on ungrazed forage (Table 3).

Table 3. Average seasonal weight gains of different classes of cattle under continuous and rotation grazing.

	Cows		Calves		Yearling steers		Yearling heifers	
	No. of head	Gain lbs.	No. of head	Gain lbs.	No. of head	Gain lbs.	No. of head	Gain lbs.
A-continuous grazing	29	53	28	181	63	154	24	169
B-rotation grazing	56	<u>25</u>	62	<u>160</u>	68	<u>150</u>	24	<u>158</u>
Difference		28		21		4		11

Data for heifers obtained in 1957 and for cows, calves and steers in 1958.

1957 grazing season - 113 days - June 3-September 26.

1958 grazing season - 119 days - June 10-October 9.

To Sum Up

Other grazing trials also show that livestock gain more weight under continuous grazing than under rotation grazing. So from the standpoint of weight gains it is inadvisable to move livestock from pasture to pasture during the season--especially at a time when the animals are making their principal gains. Undesirable results from rotation grazing come from forcing animals onto different feed and into new surroundings and from denying them access to regrowth in pastures grazed earlier in the year. The latter point is most crucial.

Weight gains comparable to those under continuous grazing can be obtained under pasture rotation grazing if livestock are allowed to move into new pastures by themselves. In this way animals can graze the range in much the same way as under continuous grazing. Movement of livestock into new pastures can be facilitated by laying out cross-fences properly with respect to topography, water and natural routes of travel of the livestock. This mode of handling livestock on ranges is a principal feature of rest-rotation grazing management.