Has Range Improvement Kept Up With Cattle Improvement?

# Half a Century of Change

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Has the long-time trend of livestock reductions on rangelands been due to range deterioration or beef cattle improvement? This trend is apparent in Figure 1. The data for this chart came from the U.S. Forest Service and are a total of cattle plus sheep (5:1) on a cattle equivalent basis grazing in New Mexico. Whenever cow size is increased substantially, the amount of feed necessary for maintaining weight will also go up. Feed requirements will also increase as the percent calf crop and calf weights increase. When this is all added up, has the total amount of feed required increased enough to affect carrying capacity?

In order to calculate this, definite statistical information is needed on what actually existed 50 years ago. This information exists in the bulletin published by Walker and Lantow in 1927. Using their basic data as a baseline, we compared it to present data from the New Mexico State University experimental herd located near Las Cruces, New Mexico. For the comparison, two basic assumptions were made: range condition has not changed (during the past 50 years) and the relative dry matter intake of cattle has not changed.

Walker and Lantow (1927) based their bulletin on a detailed survey of 127 ranches in southern and eastern New Mexico in 1925. The average size of those ranches surveyed was 61 sections per ranch. There were 754 cows, 34 bulls, 433 calves born (57%), and 361 calves branded (48%). A 12% death loss was incurred with 78% of the deaths attributed to starvation. The average cow weight was 777 lb and calf weaning weight was 323 lb. An average of 155 lb of calf was weaned per cow.

The Walker and Lantow data were used to compare to cows from the NMSU College Range breeding project (Rankin et al. 1978). The two sets of NMSU cows were Herefords (1,000-lb cow, 63.4% calf crop 411 lb weaning weight) and Brangus-Hereford crossbred cows (1,100-lb cow, 85% CC, 495 lb WW).

Dry matter intake calculations were based on metabolic weight ($WT^{.75}$) basis using the same constants for each stage of production. The stage of production, calf crop percentage and weaning weight of the calf were all included in the calculations. The calculated intakes were compared to actual values as published by Cordova et al. 1978. These were also compared to National Research Council recommendations. No allowance was made for difference in digestibility of forage by season as trends were assumed to be the same in 1925 as in the present.

Size of the cow definitely affects the daily intake. Average yearlong daily intake calculates to be about 17.5 lb per day for the 777 pound cow and 26.6 lb per day for a 1,100-lb cow if each raised a calf. Calf crop percentage plays an important role in calculating total herd forage intake. Cows without a calf are considered to be maintaining their weight, which results in a lower intake. For example, a dry, 1,100-lb cow will eat about 18 lb as compared to 26 lb per day during early lactation. When the weighted averages of stage production, size of calf, and percent calf crop are calculated, the 777-lb cow consumed 15.2 lb of forage per day yearlong as compared to 19.6 lb for the 1,000-lb cow and 22.6 lb for the 1,100-lb crossbred cow.

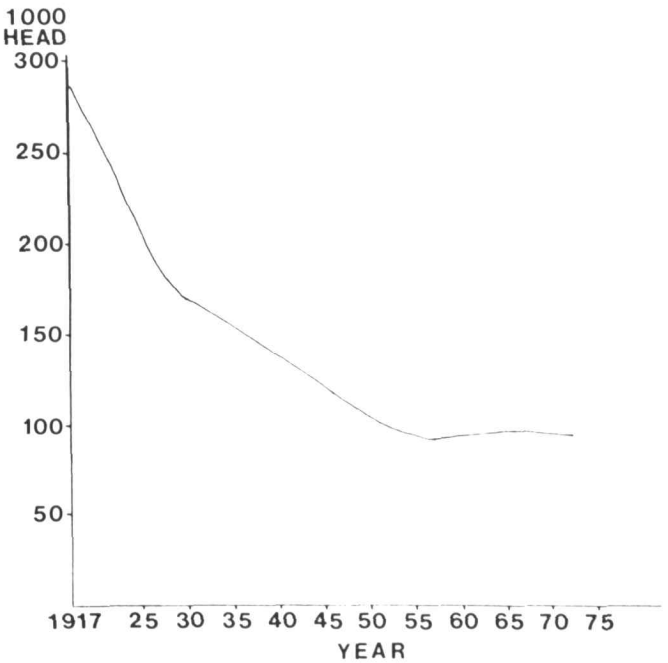


**Fig. 1.** *Cattle equivalent grazing on New Mexico's forests.*

Assuming a base herd of 800 cows with an average weight of 777 lb in 1925, they would eat 12,160 lb of dry matter per day. Now, with a herd of 1,100-lb crossbred cows eating 22.6 lb/day, only 538 cows would consume the same amount of forage and it would take only 620 cows weighing 1,000 pounds.

Let's look at this another way. Cows of 50 years ago produced 124,000 lb of beef where the crossbreds produced 226,363 lb of beef. This is done with only 67% as many cattle or a 33% herd reduction.

If we turned the screw one more turn and implanted the calves (not done on the NMSU cattle), we can expect a faster growth rate to achieve about 25 lb added per calf. This would give an additional 11,875 lb without affecting numbers. We would then have 238,238 lb of beef produced from 538

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crossbred cows, or about twice as much beef from 67% as many cows.

The decreasing number of livestock on the ranges is at least partially explained by the improvement of the livestock. Ranchers and land managers were realizing that in order to maintain range quality they had to continue to trim numbers. Undoubtedly this process was slow as the improvement in cattle is slow. If one could plot the annual forage yield removed from the range over time, there would still be a decline but not nearly as steep as the one shown in Figure 1. Also, a certain amount of improvement in the cattle came from changes in the range management area. The improved efficiency such as calf crop percentage and weaning weights would be directly affected by range condition up to a point after which increases are mainly genetic rather than environmental.

Thus, any change in cow size and production efficiency as great as the changes discussed in the article would have a pronounced effect on carrying capacity. Any rancher wanting to run the same number of cows as in 1925 should have a forage base of about 50% greater than the original. This could have been done by expanding the number of acres, or improving livestock distribution and range improvement practices.

## Literature Cited

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*Editor's Note:* The author didn't really intend to answer the question, "has range management kept up?" That would take a much longer and more complicated article. His intentions were to stimulate some thinking in this area as well as make a point that size and productivity of the animals in a herd do affect carrying capacity. We haven't paid much attention to this fact in the past in range management. We generally just consider a cow is a cow is a cow.