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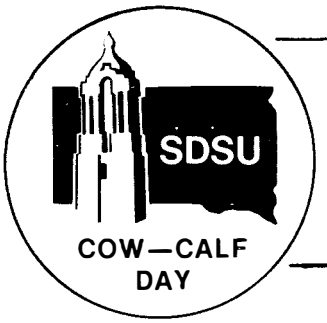

NUMBERS, CONDITION AND ECONOMICS IN RANGE MANAGEMENT

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Recently I participated in Montana's Ag Lender's Range School in Miles City. It was, in my judgment, a good session. We had the opportunity to view range research that demonstrated long-term differences in livestock performance where variable stocking rates and utilization had been practiced. In total, the "best" systems were those that were conservative and consistent with Soil Conservation Service and Montana State University guidelines.

Our evening rap sessions were just as rewarding as we tried to determine whether conservative stocking rates could be used in light of current ranch economics. We talked particularly about stocking rates in relation to ranch loans. As one might expect, opinions were divided. Many included thoughts like this: "I always calculate ranch loans based on conservative or moderate stocking. Over the long run, I would be doing my clients a disservice if I based loans on returns expected from heavy stocking rates."

There were also some who expressed a contrasting viewpoint that might be paraphrased this way: "If I used their standards (SCS or MSU guidelines), I never would be able to make a ranch loan. Maybe moderate stocking works up here, but it certainly won't work in my area."

Statements like this last one reflect a genuine conviction and a legitimate concern. The conviction would be that, in order for a ranch to pay out, it could not be conservatively stocked. The concern would be that the agencies which are most involved with range management and conservation are not in tune with economic reality.

The point is that it is difficult or impossible to get agreement on such issues. I am certain there are some of you here who wonder, as I have, what is the "best" stocking rate. I don't know that there is an absolute answer to that any more than there is an absolute answer to which cattle breed is best. Obviously, there is an acceptable bracket for both range management standards and cattle breeds.

There seems to be a paradox among a lot of producers. That paradox is that a far greater share of producers pay closer attention to the genetic quality of their livestock than they do the resource base that is directly responsible for controlling expression of that genetic potential!

Let me word that a bit differently by referring to some crossbreeding research at Cottonwood and Fort Meade. Figure 1 shows what happened to these crossbred calves in 1977 in terms of unadjusted weaning weights. A more important feature of the figure is the shape of the curves leading to those weaning weights. The daily gains are nearly constant from birth to weaning!

The cattle were on high good to excellent condition range. The trials have run for 4 years; gains in each year have been constant through weaning. For our ranges, these cattle are probably expressing their potential. If feed were in short supply as a result of low range condition or over utilization, we can only guess what would have happened to average daily gain during the last month of the trials. Experience tells us that the curve would be virtually flat (no gain) for the last month. If that had been the case, this research breeding trial would surely not be so impressive.

One is left to wonder how many producers are not able to fully realize the benefits from the expense and effort that they put into their livestock breeding programs. What I'm referring to again is the relationship between good range management and good livestock management. One without the other is hardly worth the effort.

Let's look for a moment at a stocking rate trial conducted in the mid-1950's at Cottonwood using cow-calf pairs (table 1). The cows in this trial were fed at the same level of nutrition during the winter months so that the impact of different range conditions was not cumulative as would normally exist. Let's concentrate on the numbered lines in table 1. The weaning weights (line 1) varied considerably and this is reflected in the total gain (line 2) and gross sales (line 3), both of which are on a 100-acre basis. In assessing the impact of range condition on the ranch operation, the temptation is to look only at total gain figures (line 2). When we do that, fair condition range stocked heavily looks much better (1,953 pounds per 100 acres) than good range with moderate stocking (1,321 pounds per 100 acres) or excellent range with light stocking (1,199 pounds per 100 acres). These total gains, of course, are what is reflected directly in the gross receipts (line 3) which show $879 for fair condition to $540 for excellent condition range.

When we place a charge against the cow ($100 per head) and the land ($8 per AUM), the return figures (line 4) are exactly opposite of the selling price figures (line 3). That is, conservative stocking was best. Similarly, if we place a low charge ($100 per head) against the cow and no rental fee, then better range condition with lighter stocking rates looks superior (line 5). If we increase the charge per cow toward a more realistic figure and still don't charge anything for grazing, excellent range with light stocking is far superior to the other two (line 6).

The point that is so easy to overlook is that those cows are tremendously expensive to keep and, depending on how we make our charge against them, the increased expenses of having higher cattle numbers can completely offset the increased gain per acre that we get with more cattle.

Let me stress this business of moderate or light stocking being better than heavy stocking by looking at one more example. Let us turn our attention to a private ranch operation in western South Dakota (table 2). In 1965, this particular operator made a decision to cut cow numbers by 25%, going from about 400 cows to 300, with a corresponding decrease in yearlings. The primary noticeable changes in his management were that after the reduction he has been able to summer defer 25 to 30% of his range, decreasing hay requirements considerably. Although he has witnessed no appreciable change in calving percentage, he has seen an increase of 100 pounds per head on the yearlings.

Using outdated yearling selling prices (35 cents), the enterprise now returns $10,000 plus more than it would have when running more livestock. If we use 45 cent prices on yearlings and my crude analysis, the net return for the 400-cow unit would be $21,450 compared to $28,237 for the 300-cow unit. Anywhere less than 60 cents would continue to show a distinct advantage to conservative stocking.

Let's look at a final example that is related to range condition, stocking rates and economics. Some excellent research has been done with range livestock at the Range Livestock Research Station at Miles City, Montana. Some of the more recent efforts have demonstrated the value of early spring pastures in a cow-calf operation. In my judgment, we are not seeing as many producers make good use of high quality, early spring, introduced pastures as there should be.

In the trial at Miles City, cows were kept on the same spring pasture treatment for the 5 years of the trial (table 3). All three treatments differed only in the spring pasture treatments. Cows and calves went on spring pasture about May 1 for 6 weeks each. The spring pasture treatments were native, crested wheatgrass-alfalfa and Russian wildrye-alfalfa. Gains of calves on pasture were better for the introduced pastures (line 1), but by weaning time there were no differences (line 2). The researchers believed the differences in calves weaned (line 3) and fall pregnancy percentages (line 4) were real, and, if the trials had continued longer, differences might have been greater because of cumulative effects. Thus, the pounds of calf per cow (line 5) were also showing trends for differences, with the introduced spring pastures showing the advantage, apparently a result of a flushing effect. With calf prices at 45 cents, the introduced pastures showed an advantage of $16 or $19 per cow after the cost of seeding.

Not only do early spring pastures offer direct benefit to livestock and net return to the ranch, but they also offer some flexibility in terms of range management that does not otherwise exist. For example, we are all aware that early spring grazing is hard on range. In the Miles City pasture trial, the native pasture used for the spring grazing decreased in condition from 62% at the beginning of the trial to 53% by the end. The introduced pastures did not suffer appreciably. Where introduced pastures are used, the native range can be deferred and grazed later in the season where grazing is not so damaging. This type of practice can be expected to result in range improvements much more rapidly than if spring deferment is not possible.

In summary, conservative stocking and proper range utilization are (1) generally consistent with good long-term economic returns for the ranch unit, (2) necessary in order for producers to realize the benefits of good livestock breeding programs and (3) essential for the long-term stability and productivity of the range resource. Heavy stocking can produce economic advantages over the short-term, but, when stocking leads to range deterioration, long-term losses are inevitable.

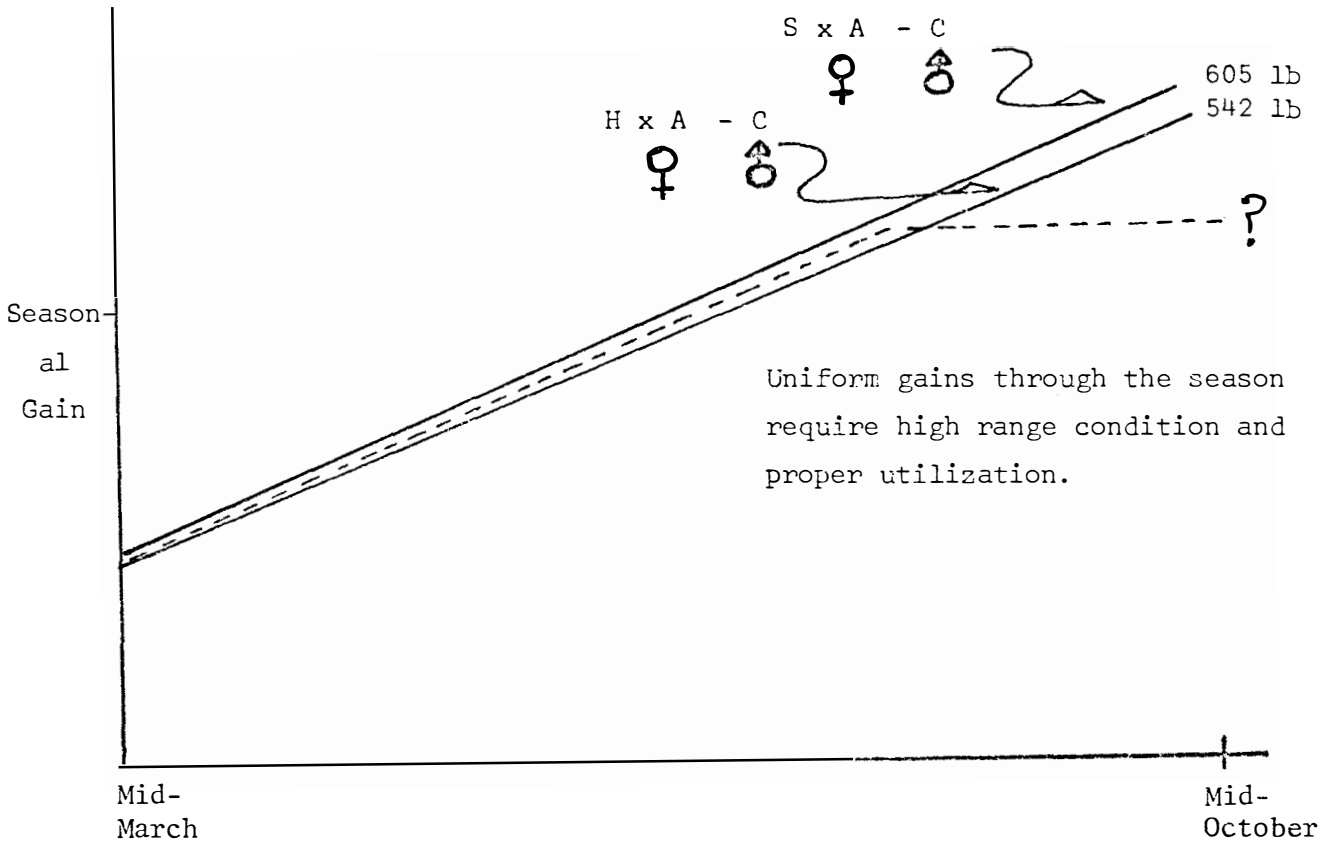

Figure 1. Generalized 4-year gain curves for crossbred calves at Ft. Meade. Weaning weights are for 1977. The broken curve is speculation as to what would happen at season's end if range condition were low and utilization excessive.

Table 1. Cow-Calf Cottonwood Stocking Rate Trial (1953-55)[a]

Range condition	Fair	Good	Excellent
Stocking rate	Heavy	Moderate	Light
Acres/AUM	1.8	2.8	3.8
AUM/acres	.55	.36	.26
Acres	100	100	100
AUM	55	36	27
AU (7 months)	7.9	5.1	3.9
Calf crop percent	78	72	83
Calves/100 acres (calf crop x AU)	6.2 calves	3.7	3.2
(1) Weaning weight	317	360	370
(2) Total calf gain/100 acres	1,953	1,321	1,199
(3) Sell calves at 45 cents per pound	$ 879	$ 594	$ 540
Cow expenses ($100)	$ 790	$ 510	$ 390
Plus $8 AUM	$ 440	$ 288	$ 216
Total variable costs per 100 acres	$1,230	$ 798	$ 606
(4) Return per 100 acres ($100 per AU + $8 AUM)	$ -351	$ -204	$ - 66
(5) Return per 100 acres ($100 per AU + $0 AUM)	$ 89	$ 84	$ 150
(6) Return per 100 acres ($150 per AU + $0 AUM)	$ -306	$ -171	$ - 45

[a] Developed from research conducted on intensity of grazing by James K. Lewis.

Table 2. Numbers and Management in a Cow-Yearling Enterprise--A Comparison of the Impact Numbers Had on a Ranch Unit in Western South Dakota

BEFORE 1965	AFTER 1965
(1) 400 COW-YEARLING UNIT	300 COW-YEARLING UNIT
(2) ALL PASTURES USED SEASONLONG	SUMMER DEFERMENT 25-30%
Cows - 400 head - no winter forage, fed 20 lb hay/day during winter-spring	Cows - 300 head in deferred pastures, fed 10-15 lb hay/day during winter-spring
180 days x 400 x 20 ÷ 2000	180 days x 300 x 10-15 ÷ 2000
= 720 tons hay per year	= 270-405 tons hay per year
(3) 1.8 TONS HAY/COW	0.9 TON - 1.3 TONS HAY/COW
Yearlings - 360 head fed 5 lb hay/day (162 T/yr) + 2 lb grain	Yearlings - 270 head fed 5 lb hay/day (122 T/yr) + 2 lb grain
(4) HAY TOTAL 882 TONS PER YEAR	HAY TOTAL 527 TONS PER YEAR
(5) YEARLING WEIGHTS (OCT.)	YEARLING WEIGHTS (OCT.)
700 lb heifers	800 lb heifers
750 lb steers	850 lb steers
90% calf crop = 360 yearlings at 725 lb and 35 cents = $91,350	90% calf crop = 270 yearlings at 825 lb and 35 cents = $77,962
Expenses	Expenses
400 cows @ $150 = $60,000 360 yearlings @ $100 = $36,000	300 cows @ $150 = $45,000 270 yearlings @ $100 = $27,000
(6) ANNUAL GROSS $91,350	ANNUAL GROSS $77,962
(7) ANNUAL EXPENSES $96,000	ANNUAL EXPENSES $72,000
(8) NET RETURN - $ 4,650	NET RETURN + $ 5,962

Table 3. Spring Pastures and Cow-Calf Production[a]

	Native	Crested wheatgrass-alfalfa	Russian wildrye-alfalfa
Acres per cow per month	4.3	1.5	1.4
COW WEIGHTS AND GAINS			
Late winter wt. (March 19)	1,084*	1,045	1,094*
Prebreeding wt. (June 14)	1,034	1,026	1,049
After breeding wt. (August 8)	1,108	1,117	1,149*
Wt. at weaning (October 27)	1,100	1,104	1,145*
CALF PERFORMANCE			
Birth weight	80	82	79
(1) Gain on spring pasture	76	92*	86*
Prebreeding wt. (June 14)	196*	216	207
Summer plus fall gain	237	237	234
(2) Weaning wt. (October 27)	433	453	441
CALF CROP			
(3) Percent weaned	82	90	92
(4) Percent fall pregnancy	89	94	95
(5) POUNDS OF COW/CALF	349	392	398
(6) RETURN/COW over control (45 cents per lb)	0	$19.35	$22.05
(7) COST OF SEEDED PASTURE PER COW	0	$ 3.50	$ 3.50

[a] From research by Walt Houston and J. J. Urick at Miles City, Montana. Spring pastures were used from May 1 to June 15 each year. Trials were conducted on summer ranges that had been grazed for many years at light, moderate and heavy stocking rates. Adjusted weaning weights of calves were 449 lb (light), 438 lb (moderate) and 427 lb (heavy) for the 5-year trial, even though all pastures were stocked at the same rate. Cow weights were not affected.

* Values are significantly different from others in same row.