

50 YEARS OF PERFORMANCE TESTING – A HISTORICAL REVIEW

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Introduction

Performance testing began 50 years ago when the San Juan Basin Research Center (SJBRC) was known as The Colorado Agriculture Experiment Station at Fort Lewis A & M College. Dr. H.H. (Stony) Stonaker had started the Colorado project in 1946 to study type and hybrid vigor in Hereford cattle. Selection of bulls from the Fort Lewis A & M herd was based on their weaning weight, weaning grade, efficiency of feed utilization and yearling grade. The grading system was based upon market grades where 6 was fancy or prime, and 1 was inferior. By feeding young bulls over a given period of time, they were given equal opportunity to develop, and their individual abilities to convert feed to gain could be determined. As a result, performance testing began in Hesperus, CO in 1949.

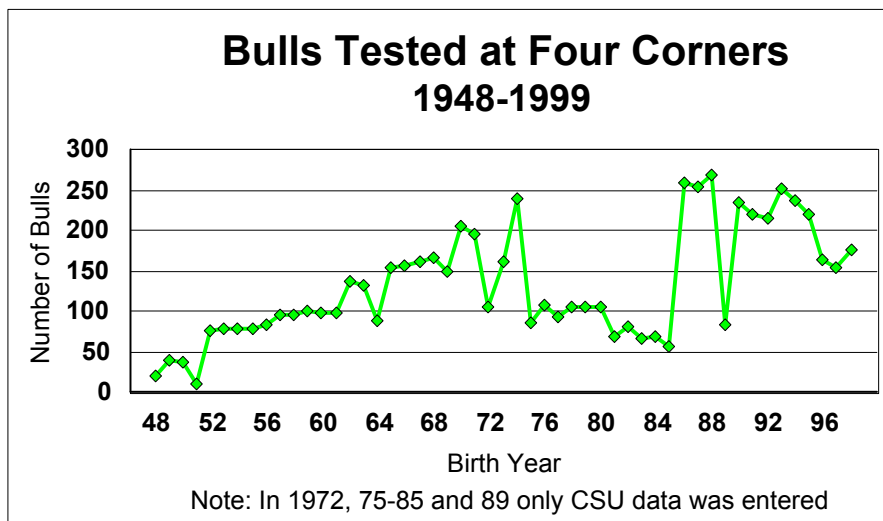
Materials and Methods

In preparing this historical review, over 6700 records were analyzed to determine raw averages and general trends. The bull data begins with animals born in 1948 and includes the bulls that will sell in the 1999 sale. Weights and measures for each year were readily available while specialty data like grades, backfat and PAP are only available in certain years.

A second set of data was gathered by collecting bull sale reports, from several sources, to give us a complete (except for the 1949 sale) set. The number of bulls tested by CSU and individual cooperators was entered for each year. Summarized data includes the number of years each cooperator participated and the total number of bulls tested. Cooperator records were not listed in the sale catalogs until 1954; therefore only CSU records were entered the first few years. Table 1 summarizes the two data sets used in the data analysis for this review. Note that the totals differ in the two data sets because of the limited amount of cooperator data that was entered in certain years of the performance tests.

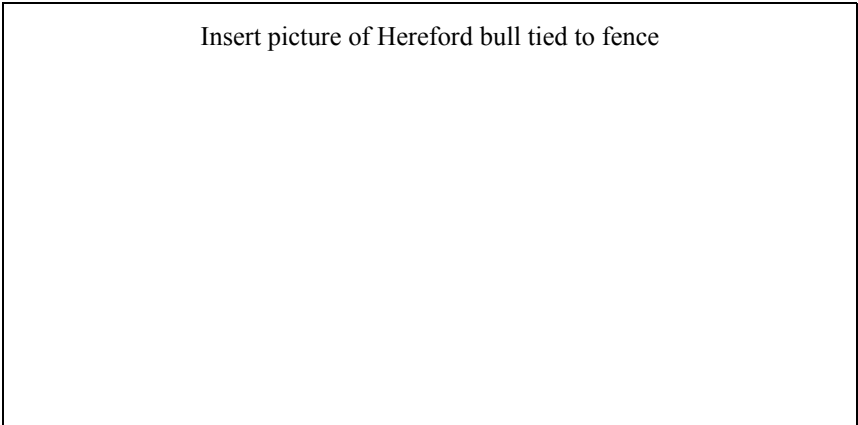
Table 1. Performance Bull Sale Data (1948-98)

Source	Total	No. of Bulls Analyzed	
		CSU	Cooperators
CSU bull card data	6760	3081	3679
Sale Catalogs	8980	3539	5441



A Review of the First 25 Years

Under the direction of Dr. Stonaker, the first bulls went on test in February of 1949. They were individually fed for 112 days. Records indicate that 20 CSU bulls were tested. Those bulls gained an average of 3.13 lbs. per day. Eleven of them were sold two weeks after they came off test in May for an average price of \$381.



Data gathered and reported from 49 to 53 included birthdate, weaning weight, weaning score, dam's age, final weight, daily gain and pounds of feed per pound of gain. Bulls were on full feed starting with a 10% concentrate mixture that was gradually increased to 65%.

Bulls were tied to the self-feeders overnight. For about 8 hours during the day, they were loose in the lots with water, salt and mineral. The 1954 sale catalog reported "that after a short training period, it takes 30 minutes for one man to tie 80 bulls to the feeders." All bulls were individually fed until 1966 when the San Juan Hereford Association began group feeding. Beginning in 1980, electric feeders were used to record individual feed consumption. After 1991 all bulls were group fed.

In 1954, weaning weights were adjusted for sex of calf, to 200 days of age, 0% inbreeding and a 6-8 year old dam. Adjustment factors originally used for CSU bulls are reported in Tables 2.

Table 2. Weaning Weight Adjustments

AOD	1954		1960	
	Bulls	Heifers	Bulls	Heifers
2	36	58	36	58
3	16	38	24	46
4	16	38	16	38
5	16	38	8	30
6-8	0	22	0	22
9	31	53	12	34
10+	31	53	24	46

Add or subtract 1.7 lbs. from WW for each day the calf is under or over 200 days of age

Add 1.76 pounds for each percent inbreeding of calf

Add 1.15 pounds for each percent inbreeding of dam

A Colorado Experiment Station index for selection was developed to combine weaning weight, efficiency and grade in an equal manner. Feed efficiency (pounds of feed per pound of gain) was adjusted for variations in initial weight. The index first reported in 1954 was:

$$\text{Original Colorado Index} = 96 + .02 \text{ WW} + 1.3 \text{ Grade} + 1.5 \text{ FE}$$

Where WW = adjusted weaning weight; G = Yearling Grade; FE = Feed eaten per pound of gain

As with all indexes, the resulting number was divided by the average index for that year. Bulls with an index of above 100 were considered to be above average.

The 1955 sale catalog indicated that all bulls would be fertility tested and guaranteed breeders. It also set the first minimum price of \$175. Beginning with the 56 test, bulls were weighed twice on succeeding days at the beginning of the test and also twice on succeeding days at the end of the test. They were also weighed every 28 days during the 112-day feeding period. A new selection index was introduced that included only weaning weight and daily gain. It was believed that the previous index underestimated the importance of weaning weight. This new index gave approximately 4 times as much emphasis to weaning weight as to daily gain:

$$\text{Revised Colorado Index} = .7 * \text{WW} + 35 * \text{ADG}$$

Where WW = adjusted weaning weight; ADG = average daily gain

Additionally, beginning in 1956 a “somscope” was used to ultrasonically determine the amount of fat the bulls had at the end of the test. Kent Riddle became the local project leader in 1956 and served in that capacity until 1969.

The feeding period was increased to 140 days in 1957. As a result the test began in late December so the sale could remain at the end of May. Results of the CSU bulls vertebrae X-rays were classified as they related to the dwarf gene and reported in the catalog. The Colorado index formula was clarified and now gave about twice as much emphasis to variations in weaning weight as to daily gain.

$$\text{Revised Colorado Index} = \text{WW} + 50 * \text{ADG}$$

Where WW = adjusted weaning weight; ADG = average daily gain

In 1958, the practice of individual feeding was discontinued for one year. An excerpt from the 59 catalog reads “Because individual feeding allowed greater ease of handling and gentling of the bulls and furthermore provides a means of measuring feed efficiency, the 1959 bulls again have been individually fed.”

Weaning weight adjustment factors for CSU bulls were revised in 1964 as a result of studies being done in the San Juan Basin herd. Table 3 summarizes these changes.

Table 3. Revised Factors for Adjusting Weaning Weight (1964)

AOD	Heifers	Bulls	Inbreeding	Per 1% inbreeding	
				Heifers	Bulls
2	55	63	Of Calf	.24 lb	.41 lb
3	29	36	Of Dam	.79 lb	.78 lb
4	14	15			
5 +	0	0			

Age of calf – Adjusted to 200 days of age on the basis of the calf’s own growth

Sex - Add 25 pounds to heifers

From 1964 to 1973, certain Hereford bulls were designated as being able to produce “Guaranteed Heavier Weaning Weights”. These bulls were guaranteed to sire calves, which were heavier at weaning, or the bull could be returned and the purchase price refunded. The program had a list of criteria and a signed agreement in each year’s catalog.

Insert aerial picture group fed bulls

The year 1966 brought about a lot of change at the test center. Dr. Jim Brinks joined the CSU Animal Science department and took over Dr. Stonaker's duties. Secondly the test was divided into three groups (X, Y and Z). The X plan was station bulls that were individually fed. The Y plan consisted of cooperator bulls that were individually fed along with the CSU bulls. Plan Z bulls were owned by members of the San Juan Hereford Association and were group fed. All plans were fed the same ration.

In 1968 the test and sale was moved up a month. Bulls went on test in November and the sale was at the end of April. Pete Fagerlin took over for Kent Riddle as station superintendent and local project leader in 1969. The sale was moved back 2 weeks to the second Saturday of May. General eligibility requirements were printed in the 1969 catalog.

"To be eligible for the test bull calves on all 3 plans had to be born between March 1 and May 15, 1968. They were raised on dam with no access to nurse cow or creep feed. They were tested free of Tuberculosis and Brucellosis before being placed on test and again in early January. To be eligible for the sale all bulls must have an average daily gain ratio of at least 90% of group average and must have a satisfactory semen and breeding soundness evaluation."

These requirements were modified over the years to reflect the changing data. In 1978 bulls had to have at least a 95% ADG ratio to sell. In 1979, BCIA bulls had to perform in the top 2/3 of their contemporaries in order to sell. An additional BCIA sale requirement was added in 1985 stating that bulls must be in the top 2/3 of their contemporaries for yearling weight to sell. The 1990 sale requirements were tightened so that bulls had to be in the top 75% of their contemporaries to sell.

Unadjusted weaning weights were printed for cooperator bulls for the first time in 1970. A disclaimer was also printed stating that "Although these values are very useful, critical bull comparisons should be made on daily gain on test because of preweaning differences between ranches."

The 1972-73 test no longer offered the guaranteed increase in weaning weight agreement and Warren Mangus replaced Pete Fagerlin as the local project leader.

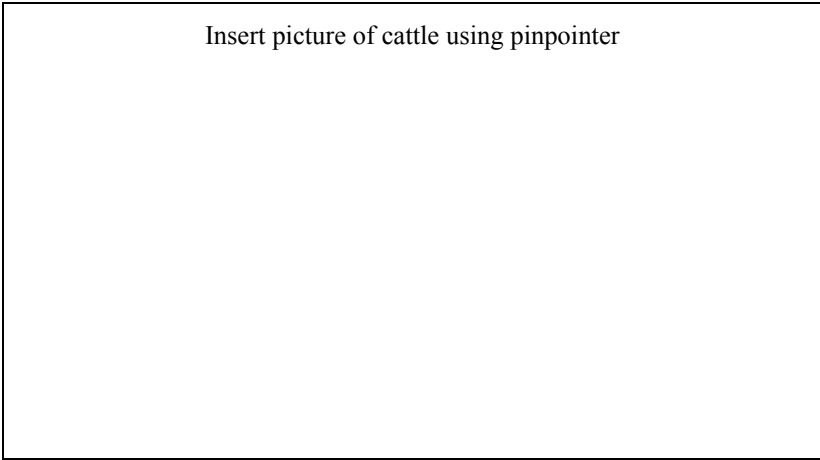
A Review of the Next 25 Years

Al Denham began his tenure as SJBRC Superintendent in 1974 and the Four Corners Beef Cattle Improvement Association (BCIA) was formed. A new test facility at the Center was built and 145 cooperator bulls were fed in pen groups the first year. This new facility consisted of 40 pens suited to test sire groups of three to six bulls per pen. Pen feed conversion was reported for all bulls tested in the new facility. The new barn ended the need for the X, Y and Z plans. Adjusted WW and Ratios were first reported on cooperator bulls with WW being adjusted for age and age of dam.

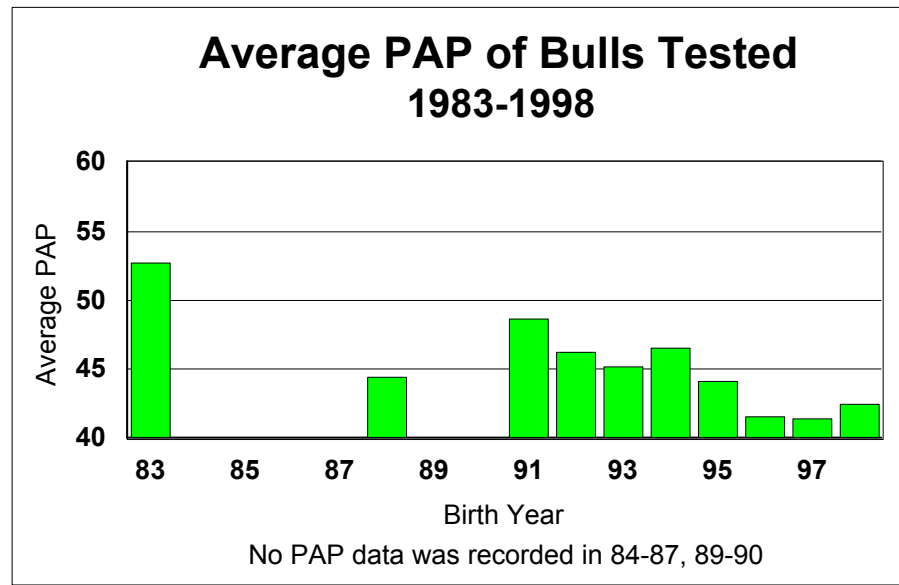
CSU continued to individually feed their bulls in the Center's test barn. During the 140 day test, different rations were fed to the two sets of bulls. The BCIA bulls received a ration that was at least 75% silage during the entire test while the CSU bulls received more hay and at the most, 60% silage. The CSU bulls were fed once a day while the BCIA bulls were fed twice daily. It was recommended that "Performance data for the CSU and 4-Corners BCIA bulls should be evaluated as two separate tests since rations, methods of feeding, and facilities were different."

The 1979 sale was dedicated to Dr. Stonaker for his dedication and guidance over the first 30 years of the performance test.

CSU began using electronic feeders (pinpointers) to measure individual feed consumption in 1980. Pinpointers allowed one bull to enter the feeder at a time and fifteen bulls were allowed per feeder. Individual feed consumption was recorded by a mini-computer that was attached to each feeder.

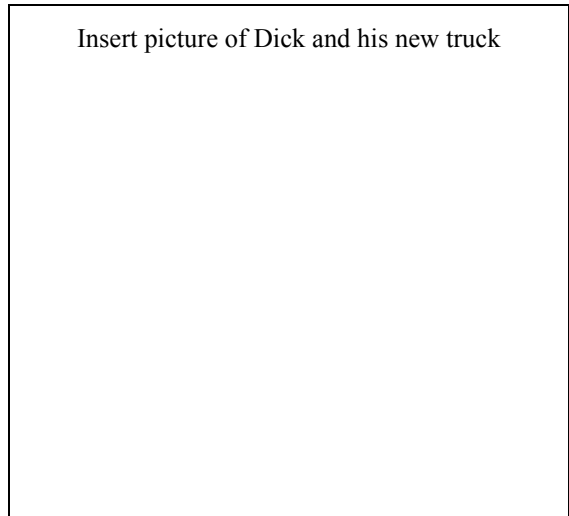


The Four Corners Bull Test's elevation of 7600 feet gives it the unique distinction of being the nation's only high mountain bull test.



To complement this designation, PAP (pulmonary arterial pressure) was first recorded in 1984 on all bulls. This test is the best indicator for identifying animals predisposed to Brisket Disease (High Altitude Disease). Generally, cattle with PAP values greater than 50 are considered high and cattlemen should be cautious of using them at elevations above 7000 feet. The graph shows how the average PAP pressures have changed from 1985 to the present.

In 1988, the length of the test was decreased to 120 days to accommodate more modern management styles and to allow more time to condition the bulls for range breeding. In 1990, Expected Progeny Differences (EPDs) were printed in the catalog for the first time for both CSU and cooperator bulls.



1990 was also the last year that Dick Holway fed the bulls. He was a conscientious manager that dearly loved his bulls. He began feeding in 1974 when the new barn was built. As a going away present, the BCIA cooperators presented him with a new Ford Pickup.

Al Denham retired after 19 years service, he was instrumental in the growth and success of the Four Corners Bull Test and Sale. Al continued to assist with the BCIA for a few years after his retirement and sat on the auctioneers stand until 1998.

David Schafer arrived in the fall of 1991 and assumed the duties of SJBRC Superintendent in 1993. Beginning that year, all bulls were group fed in either the BCIA barn or separate CSU pens. While the two groups of bulls were fed identical rations, the cooperator pens held 3 to 6 bulls while the CSU bulls were fed in groups of 8 to 12. This difference created different test environments. Therefore, twenty-eight Herefords were tested in the Four-Corners facility to allow for direct comparison of all Herefords.

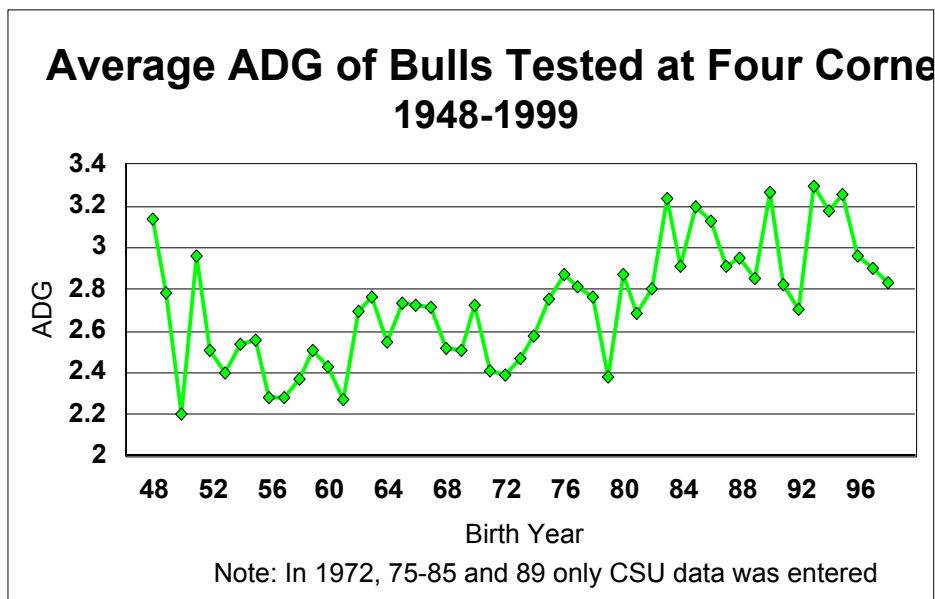
In 1992, all the CSU purebreds were tested in the Four-Corners facility to allow for direct comparison. The remaining crossbred bulls from the SJBRC herd were tested in the CSU group pens. A “calving ease” designation was added to sale bulls that had low actual birth weights and desirable birth weight EPDs. This designation continues to be very popular among buyers looking for heifer bulls.

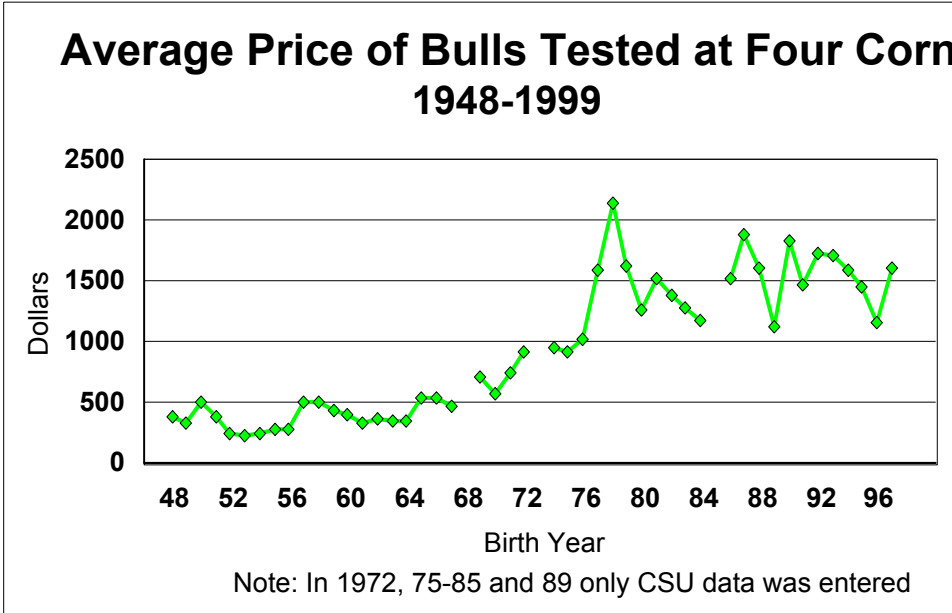
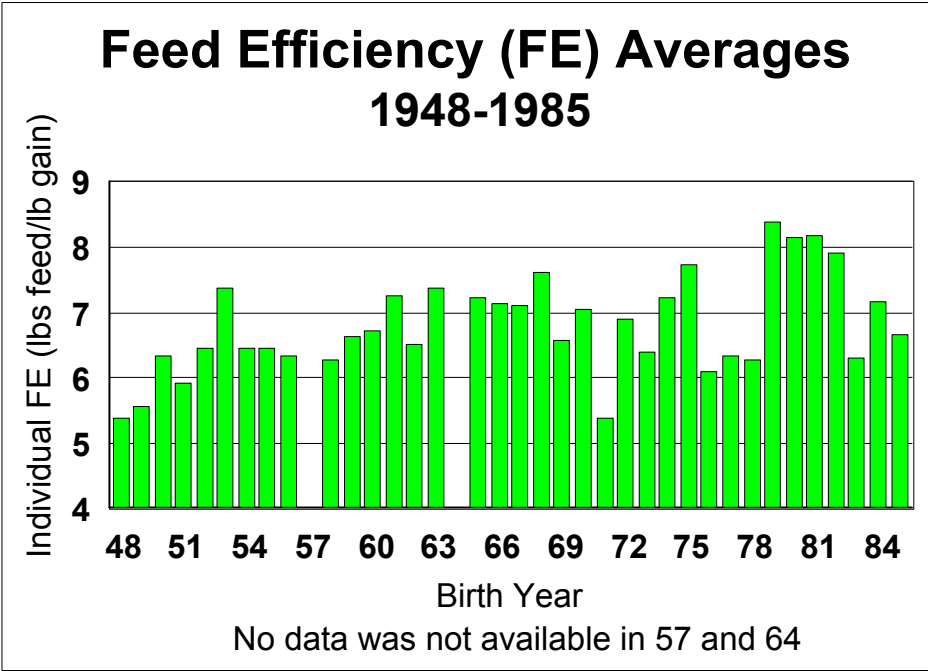
The 45th annual Four Corners bull sale was simultaneously broadcast via Superior Productions in 1994. That first year 12 bulls were sold to absentee buyers. That number has grown to 38 bulls being sold to video buyers in 1998. Because of the video recording, sale bulls have been washed and clipped by the LaPlata County 4-H Livestock Judging team since 1994.

The length of the test was reduced to 112 days in 1995 and the sale was set for the first Saturday in April. Ultrasonic measures for ribeye and backfat were collected for one year to provide a guideline for carcass cutability potential of the bull’s offspring. Beginning with the 1997 sale, all bulls were fed in the Four-Corners test facility.

Summary

The 50th annual Beef Cattle Improvement Sale brings with it a rich history that has included the testing of approximately 8980 bulls from CSU and cooperator herds. The following graphs summarize the bulls tested each year by ADG, feed efficiency and price by birth year of bull.





During the 50-year span of performance testing at Hesperus, over 350 different breeders have tested bulls. CSU and Redd Ranches have been testing since the beginning while many others have tested for over 25 years. The following table summarizes data from cooperators that tested at least 15 years at the Four Corners Bull Test.

Ranch Name	First Name	City	State	First Sale	# of Years	Total # Tested
CSU	SJBRC	Hesperus	CO	50	50	3539
Redd Ranches	Charles and Paul Redd	Paradox	CO	54	47	384

Sitton Hereford Ranch	George and Jim Sitton	Bayfield	CO	57	33	147
Paulek Ranches	Grant & Victor Paulek	Hesperus	CO	54	30	203
	C.W. Huntington	Hesperus	CO	69	30	298
	Brice Lee	Hesperus	CO	73	27	233
Continental West Angus	Bob Wilcox	Durango	CO	77	19	113
	R. Kedric Somerville	Monticello	UT	74	18	90
	Gary Witherspoon	Ignacio	CO	76	18	128
	W.W. Ritchie	Buffalo	WY	75	17	146
Everett Ranches	Larry Everett	Mancos	CO	73	17	60
	O.W. Crowley	Chromo	CO	57	17	76
Bartel Herefords	Lawrence Bartel	Mancos	CO	73	16	89
Vaca Roja Ranch		Ignacio	CO	82	16	76
	Irwin Crowley & Sons	Chromo	CO	55	15	54
Reininghaus Cattle Co.	John Reininghaus	Merced	CA	85	15	115

Note: Cooperator data was not available for the first few years of the test so the maximum number of years is 47.