

GRASS-FAT BEEF - MYTH OR REALITY

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Worldwide population increases will continue to put greater demand on beef production and put man and beast on a more competitive basis for cereal grains. Cattle feeding, by necessity, may depend more upon range and pasture forages and we may look to rangelands to produce slaughter grade beef. It is important that we utilize our rangelands to the fullest extent for meat production to conserve feedstuffs that could be consumed directly by man. These statements were made in one form or another when this station introduced the idea of "grass fat beef" in the mid-1960s and we think is even more true today.

Since the initiation of our "grass fat" studies, several things have happened to enhance the proposal. On the negative side, as the consumer became more concerned with excess fat on meat, there was a trend to put a lot of poor quality cattle on the market that were sold as grass fat or lean beef. Many of these were dry cows and poor quality animals that could not be fed efficiently to a higher grade. This poor quality meat turned off the consumer and slowed down the rate of acceptance of "grass fat" beef. On the positive side, changes were made in the grading system, and probably most important, research was conducted on meat quality and relationship of high-standard or low-good grade of meat to choice grade with respect to quality measures such as tenderness, taste, juiciness, cutting, and cooking.

When we started our program on "grass-fat" beef some 15 years ago we had no intention that any type of cattle would fit. The intention was good quality cattle, that could be fed effectively to grade choice, would provide an acceptable high quality carcass if they were fed to low-good grade at an acceptable age. This means that the decision on the fate of the animals needs to be made at weaning time. If it is to go on the grass-fat program, the animal should be put on a continuous gain ration so it will gain at near its growth potential. It can then be supplemented on range to produce a slaughter grade carcass at 18 to 20 months of age.

It was never intended that grass be the only feed supply for the so-called "grass-fat" beef, but that the animals would be "prescription" supplemented to optimize production of beef from the forage. Grain is fed as a supplement or complement to the forages rather than a replacement for the forage for the first half of the season, usually 90 to 100 days from May to early or mid-August. During the second half of the season, or until about mid-November, animals are left on range and gradually brought up to a free-choice grain level with access to all the forage they desire. In a sense, during this second phase, the forage selected by the animal becomes a supplement to the grain. The level of forage intake during this time of year increases or decreases depending on the quality of forage. If we had six months of high quality forage, the amount of required grain could be reduced. Unfortunately, this is not the case.

Probably the term "grass-fat" is a misnomer and the term "slaughter grade" would be more acceptable. We must recognize that the quality of forage on our western rangelands and in most of the arid parts of the world is very seasonal with respect to quality. The forage quality is high in the early part of the growing season and drops rapidly as the forage goes through the growth cycle to maturity. This forage on the sagebrush-bunchgrass ranges is capable of providing for cattle gains of two pounds or more per day during May and early June, one and one-half pounds during late June and July, and less than a pound per day from early August on. The supplementation program was designed to replace those nutrients as they decrease in the forage to meet the needs of the animal to maintain two pounds or more gain per day. This can be done effectively until about mid-August, or until the supplement level reaches about three pounds per day without adversely affecting the level of forage intake. After this time, it becomes a matter of not replacing the forage nutrients as quality goes down and voluntary forage intake drops.

The data collected over the last 15 years have been reported in various publications. Tables 1 through 5 summarize most of these data. For brevity, the specifics of some of the designs have not been included and data have been averaged to show the general trends. For example, various sources of protein and energy and systems of feeding and grazing have been averaged.

The daily supplemental intake and rate of gain of non-supplemental steers and steers subjected to the supplemental program are shown in Tables 1 and 2, respectively. It should be pointed out that the animals had access to an adequate supply of standing forage throughout all these studies. The total consumption of grain averaged about 1.25 pounds per head per day during the growing period and 11 pounds per day during the finishing period. Forage intake was normal during the growing period and was reduced to about 12 pounds of forage per day during the finishing period. During some of the years a representative group of steers was put in the feedlot in mid-August for comparison to cattle on the grass finishing study. Cost of gain, carcass quality measures, and economics are presented in Tables 3, 4, and 5.

Average daily gain on range was 2.25 pounds per day as compared to 3.0 pounds for those in the feedlot. Carcasses from range fattened cattle were lighter, graded lower, and dressing percentages were lower than those from the feedlot finished group. How much of this dressing difference is from carcass weight and how much to type of ration cannot be determined from these data. Yield grades favored the animals from the range slaughtered group. Both of these factors, dressing percent and yield grade, are important when interpreting gain data.

On the total feed costs from actual carcass value, the net varied from \$305 to \$331 between treatments. This does not consider the value of the steers going onto range, which would reduce the net considerably. However, it does permit a comparison between feeding systems. Yardage fees, interest on money, equipment, environmental preservation costs, labor, and other costs

are not included and would reduce profit on all treatments, but not as much for range fattened animals as those in the feedlot. Range fattened animals returned more per dollar invested in feeds even disregarding the above considerations.

Table 1. Daily supplemental intake of yearling steers during the grazing period

Date	Supplemental level	
	cottonseed meal	barley
	lb	lb
May 1-31	-	1.00
June 1-15	-	.60
June 15-30	.35	.30
July 1-15	.75	.40
July 15-31	.90	1.25
August 1-15	1.10	2.00
August 15-31*	1.40	5.50
September 1-15	1.40	8.40
September 15-30	1.40	11.50
October 1-15	1.40	14.00
October 15-31	1.40	17.00
November 1-15	1.40	17.00

* Starting at this date, supplemental levels continued to increase for the finishing phase.

Table 2. Average daily gains of yearling steers with and without supplements during the grazing period

Period	Supplement schedule		
	None	Mid June to mid November	All season
	lb	lb	lb
May 1-June 15	2.25	2.25	2.75
June 16-July 31	1.50	2.75	2.75
August 1-September 15	.75	2.30	2.30
September 16-November 15	.25	2.20	2.20
Average	1.20	2.37	2.50

Table 3. Gain and feed data during the finishing period

Item	Range finish	Feedlot finish
Number of animals	60	60
Days on feed	93	90
Animal weight, lbs	792	792
Final weight, lbs	1001	1062
Average daily gain, lbs	2.25	3.0
Daily feed intake ^{1/}		
Hay	--	2.3
Barley	11.0	21.2
Beet pulp	.22	3.5
Cottonseed meal	1.54	--
Total feed intake	1187.0	2430.0

^{1/} Does not include about 12 pounds of range feed per head per day for the range finish group.

Table 4. Carcass data

Item	Range finish	Feedlot finish
Warm carcass weight, lbs	569	621
Dressing, %	56.7	58.6
USDA Grade		
Choice, %	10	83
Good, %	85	17
Standard, %	5	0

Table 5. Summary of growing and finishing period on a per head basis

Item	Range finish group	Feedlot finish group
Carcass value, \$ ^{1/}	386	453
Total feed costs, \$ ^{2/}	81	122
Net over feed costs, \$	305	331
Return per \$ invested in feed, \$	3.80	2.66
Total grain intake, lbs	1296	2331
Carcass/lb grain, lbs	.44	.28

^{1/} Range finished carcasses were valued at 70 and feedlot finish at 73 cents per pound.

^{2/} Hay was valued at \$50, barley at \$100, cottonseed meal at \$275, and beet pulp at \$100 per ton.

Range fattened steers consumed about 50 percent as much as the animals on other treatments and produced more carcass per unit of grain fed. In general, it was concluded that it is possible to feed cattle on range to produce a desirable carcass at an economical level. Lighter carcasses from range fattened animals with less fat were in great demand by buyers who were making their selection in the cooler rooms. This is especially true of low choice and high good carcasses, all carrying a minimum of fat.

It appears that if high quality USDA good grade beef were always available in the marketplace, the consumer preference would be for that grade over choice and prime grades. Also, there is considerable doubt, as expressed in the literature, as to how much influence carcass grade has on taste and acceptance of meat. It is possible that if grade labels were removed from cuts of meat, consumers would select leaner good cuts most of the time.

There are a number of advantages to fattening steers on range or pasture. Because of the low density of cattle in comparison to feedlots, range feeding does not contribute to water and air pollution problems. Less confined conditions also provide for drier, healthier feeding conditions and eliminate the need for manure removal which may mean a savings in both veterinary costs and labor. Range feeding does not require permanent feed bunks and expensive handling equipment. Overhead costs and selling expenses may be less because of retained ownership in keeping cattle at the ranch location to slaughter time.

It should be pointed out that even if range finishing became an integral part of the livestock industry, it is questionable that it would ever replace the conventional feedlot. The carrying capacity of available ranges would be a limiting factor. Also, the density of forage on a range is a factor. If we have a range with carrying capacity greater than three acres per AUM, the distance cattle have to travel for feed would have an adverse effect on rate of gain. The average carrying capacity of the semi-arid ranges is probably

8 to 20 acres per AUM, thus, opportunities are somewhat limited and would have to be confined to those areas of improved native range either through spraying, and/or the introduction of new grasses.

These ranges are generally better suited for cow-calf production and it seems unlikely that the production of slaughter animals off range would (or should) increase to the extent that it would adversely affect the number of brood cows that can be carried. Therefore, the possibility of production of slaughter grade cattle from range replacing conventional feedlot cattle is remote. On the contrary, range production provides another marketing channel for cattle producers and another choice for meat consumers. Undoubtedly, we will always have feedlot beef in this country. A market probably will always exist for highly finished beef for certain clientele. However, there is a tremendous market for leaner beef, particularly through the fast food chains and more specifically through those chains that use primarily ground beef in their offerings. However, we must remember the overall beef system which is used ultimately migrates to the one paid for in the marketplace and to the one which is most profitable.