

Does Range Have a Place in Beef Production Systems of the Future?

C. Wayne Cook, John K. Matsushima, and David A. Cramer

In a recent publication by Brokken et al. (1980), it was stated that fattening cattle with grain in confinement was the least costly way of producing beef and, conversely, fattening cattle on pasture (range non-grainfed) followed by a short finishing period on grain was the most costly. These conclusions were arrived at by the use of four models that considered various objectives and constraints. It was stated that these beef production models were believed to be applicable to the entire United States. Comparisons were made for almost complete confinement feeding from 6 months of age until slaughtered with nonfed animals that grazed ranges or forages until slaughter and various combinations of the two extremes. These findings are contrary to many recent studies that have compared grazing range and forages to feedlot finishing or the use of forage and range along with short and long feedlot finishing periods (Cook et al. 1980; Nelson and Landblom 1978; Schupp et al., 1979).

During the past decade the Departments of Range Science and Animal Science at Colorado State University have studied alternate beef production systems using a typical plains grassland ranch and various breeds of beef cattle. Complete costs along with range and animal responses have been recorded in great detail over this period.

A report from this study by Denham (1975) showed that cows and calves raised in total confinement during a 4-year period lost from \$53 to \$74 per cow per year while those raised on the range with only 1 to 2 pounds of alfalfa daily during the winter produced a profit of \$28 to \$30. Those that grazed range for 7 months during spring, summer, and fall but were confined and fed during the winter showed a return of \$22 to \$31. It was concluded in this study that cows raised in total confinement for 4 years exhibited a higher rate of calving difficulty, lowered reproductive performance, and less profit than cattle in semiconfinement or native range grazing systems.

In still other studies from the Colorado Experiment Station, Cook et al. (1980) found that sensory panel evaluations which included tenderness, flavor, and juiciness showed no significant difference in acceptability ratings for animals grazing range in conjunction with forage sorghums and crested wheatgrass compared to animals produced from feedlots. Animals slaughtered directly off the range at 18 months of age graded 45% Good, 3% Choice, and 52% Standard at a cost of \$0.63/lb of retail beef. Animals of the same age that had complementary grazing from crested wheatgrass during early spring and sorghums during late summer and winter produced 70% Good, 4% Choice, and 26% Standard at a cost of \$0.75/lb of retail beef.¹

Authors are professor, Dept. Range Science, and professors, Dept. Animal Science, respectively, Colorado State University.

¹ These costs do not include costs of money invested in either land or livestock.

Steers that were taken from the above two grazing treatments and fed for short finishing periods comparable to the least efficient method by Brokken et al. (1980) were more costly than the range and forage grazing systems and less costly than longer feeding periods. Steers from range that were placed on fattening rations for 60 days graded 50% Good, 33% Choice, and 17% Standard at a cost of \$0.84/lb of retail beef and steers from range and forage sorghums that were placed in the feedlot for 60 days graded 62% Good, 19% Choice and 19% Standard at a cost of \$0.91/lb of retail beef. The cost was higher for the complementary forage system but the quality of beef was not materially different from the animals from native range that were fed for 60 days. Animals fed an additional 30 days (90 days total) increased in fat content to the extent that 2/3 to 3/4 of the animals graded Choice with an additional cost of \$0.14 to \$0.22/lb of retail



Above, cattle grazing native sandhill range in eastern Colorado; and below, steers grazing sorghum forage when native range is dormant or short as a result of dry months in late summer.

meat, respectively, for the two grazing treatments. Similar results were obtained by Nelson and Landblom (1978) and Schupp et al. (1979). From the study by Cook et al. (1980) it was recommended that smaller frame animals be used on range with a short feedlot finishing period of 40 to 60 days to produce Good grade meat or grazed on range and complementary forages to the quality grade of Good.

It is not certain how the economists (Brokken et al. 1980) ran their models or what information was placed into them, but the inference that confinement feeding is cheaper than grazing range or forage at any phase of beef production other than the obligation to obtain "Choice" grade in the final finishing stages must be in grave error.

It must be understood that only a few animals will attain choice grade while grazing forage of any nature and then only small frame animals will do so generally. Thus a steer could possibly graze a lifetime and not reach Choice grade. Therefore, if the objective is "Choice" grade, a model might add time and feed at an unreasonable cost that would bias the real costs of grazing range and forage for an acceptable beef product.

However, studies to date (Cook et al. 1980) show rather conclusively that raising animals to quality grade of "Good" on range and complementary forages is indeed acceptable to the consumer and that meat can be produced at considerably less cost than by feeding high concentrate feeds to produce excessive fat that is currently pricing beef out of the market place. What is needed is a coordinated effort by the cattle industry to develop a market for Good grade beef.

Data from the various feeding regimens used in the study by Cook et al. (1980) showed that animals on short term feeding systems following range or forage sorghum grazing made the most efficient gains because of perhaps compensatory responses resulting from moving animals onto higher nutritional levels. Steers weighing about 935 pounds at 18 months of age gained 4.43 pounds per day from the consumption of 20 pounds of TDN during the first 60 days of

confinement feeding, compared to only 2.40 pounds gain per day from consumption of 24 pounds TDN per day during the 30-day period from 60 days to 90 days of finishing from rations. Efficiency of feed conversion to animal gain decreases rather markedly when feeding to obtain a higher quality grade of beef such as from Good to Choice and thence to Prime.

At the end of the grazing period steers dressed 55%, whereas at the end of a short feeding period of 60 days they dressed 60%, which also increased their efficiency because of the additional weight of the carcass. An additional feeding period of 30 days to a total of 90 days on feed did not increase dressing percentage or weight of lean meat appreciably. Most of the added body weight during the last 30 days of feeding was fat deposits, which required more energy intake to produce than lean meat by as much as 2.21 times. For this reason, finishing animals to quality grade of Good either on range along with complementary forages or on range with a short feeding period of 40 to 60 days to grade as Good appears to be a new alternative for the beef industry that merits consideration.

Literature Cited

- Cook, C. Wayne, Larry R. Rittenhouse, E.T. Bartlett, John W. Walker, Mark E. Ebberts, Bernard M. Jones, David A. Cramer, Arthur C. Linton, Peter T. Fagerlin, and Mark C. McKean. 1980. Alternated meat production systems, Progress Report to the National Science Foundation. Colorado State University.
- Brokken, Ray F., Carl W. O'Connor, and Thomas L. Nordholm. 1980. Costs of reducing grain feeding of beef cattle. USDA Economics, Statistics and Cooperative Serv. Agr. Econ. Rep. No. 459.
- Denham, A.H. 1975. Cow-calf performance in total confinement, semi-confinement, and on native range. Colorado Exp. Sta. Progress Rep. No. 52.
- Nelson, James L., and Doug L. Landblom. 1978. Grass fed beef. 1978. North Dakota Farm Res. 36:6-8.
- Shupp, Alvin, Thomas Binder, William McKnight, David Smith, John Carpenter, Jr., and Fred Wiegmann. 1979. Acceptance of beef finished on forages or with limited grain. Louisiana Exp. Sta. Bull. 714.

The Professional Society for Rangemen

The Society for Range Management (founded in 1948) is a private, nonprofit, professional association dedicated to advancing a comprehensive understanding of range ecosystems and the intelligent use of all range resources. The Society assists all who work with rangelands to keep abreast of new findings and applications in range management and strives to create a public appreciation of the benefits to be derived from proper rangeland use.

Membership in the Society is open to anyone engaged in or interested in the study, management, or use of rangeland ecosystems. Members from countries worldwide include research scientists, ranchers, governmental agency administrators, advisory and technical assistance personnel, teachers, students, and people from the business community.

For additional information on membership, contact the *Executive Secretary*, 2760 West Fifth Avenue, Denver, CO 80204.