

# Questions and Implications for Range Management Based on the Demand Outlook for Red Meat and Range Grazing

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This demand outlook for red meat and range grazing and the questions it raises for range management begins with the rapid growth in beef demand after World War II. The next segment reviews trends since 1976. The outlook for the future follows. The view of range grazing is long term and includes both rangeland and pasture use. It does not seem useful to review one without the other.

## Period of Rapid Growth—1945 to 1976

### Beef Demand

Beef production was a growth industry following World War II. Beef consumption rose from about 46 pounds per person per year, retail weight, in 1950 to almost 95 pounds in 1976 (Fig. 1). Total beef production (Table 1) increased fas-

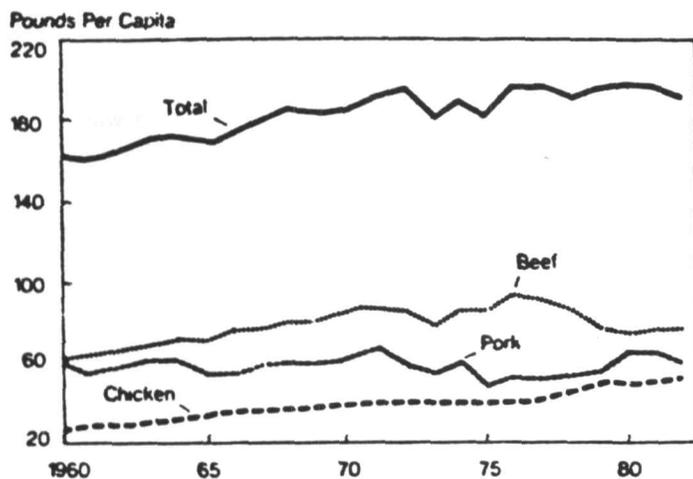


Fig. 1. Beef, pork, chicken, and total meat consumption, 1960-83. Source: USDA

ter than population and per capita disposable real income.

During this period the retail price of choice beef declined relative to the consumer price index. Beef tended to become a relatively better buy compared to all consumer goods. Pork prices were cyclical but tended to rise compared to beef (Fig. 2). Per capita consumption of pork remained stable but it cycled more or less between 50 and 60 pounds.

Retail chicken prices dropped sharply relative to beef. Per capita poultry consumption increased more rapidly than beef, but the beef share of per capita total meat consumption

Table 1. Beef production and cattle numbers, 1965-1985. Source: USDA.

Year	Beef Production (billion lbs.)	Cattle on Farms: January 1	
		All cattle (million head)	Beef cows
1965	18.7	109.0	33.4
1966	19.7	108.9	33.5
1967	20.2	108.8	53.8
1968	20.9	109.4	34.6
1969	21.2	110.0	35.5
1970	21.7	112.4	36.7
1971	21.9	114.5	37.9
1972	22.4	117.9	38.8
1973	21.3	121.5	40.9
1974	23.1	127.7	43.2
1975	24.0	131.8	45.7
1976	26.0	128.0	43.9
1977	25.3	122.8	41.4
1978	24.2	116.4	38.7
1979	21.4	110.9	37.1
1980	21.6	111.2	37.1
1981	22.4	114.3	38.7
1982	22.5	115.6	39.3
1983	23.2	115.0	38.8
1984	NA	113.7	37.5
1985	NA	109.8	35.9

increased from 38 percent to 46 percent. Beef became the strongly preferred animal protein source in the mid-seventies.

### Range and Pasture Use

Range grazing reached its historical peak level in 1975. In that year the total cattle herd numbered 132 million (Table 1). Cattle numbers increased in 21 of the 30 years since 1945. The low point of each cycle remained substantially above the preceding low. The 1945-1975 increase was 54 percent above the 1945 peak. That was the same as the increase in the U.S. population. The 54 percent increase includes dairy cows and heifers which declined in this period and obscures the real growth in the beef cattle. A better indicator of the rapid rate of expansion of beef sector is the number of beef cows (Table 1). They increased from 16 million to 46 million. It is also worth noting that the proportion of all cows calving rose from 80 percent in 1945 to over 94 percent in 1973. The latter percentage fell to 88 percent in 1975 as calf and steer prices dropped sharply in 1974 and 1975.

In 1977 non-Federal rangeland totaled 408 million acres

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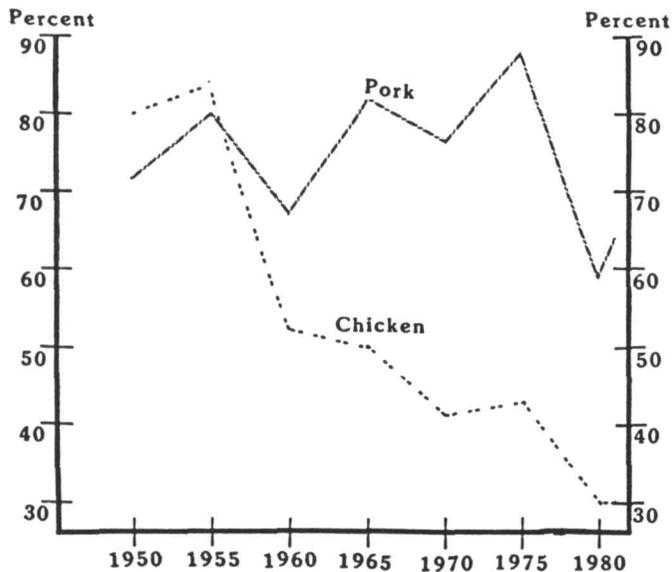


Fig. 2. Pork and chicken retail prices as a percent of beef prices, 1950-1981. Source: NCA, 1982

and pasture was 134 million acres. Range conditions had improved significantly. According to the 1980 RCA Appraisal range in excellent and good condition rose from 20 percent to 40 percent between 1963 and 1977. Range in poor condition declined from 40 percent to 18 percent. This was accomplished through the workings of the private sector with the assistance of USDA conservation programs.

Pasture lands were a major factor in the expansion of the beef cattle herd. They increased 30 percent in the 1967-1977 decade and provided 54 percent of the grazing capacity on private lands in 1977.

The shift of land out of crop production, some 27 million acres from 1949 to 1974, contributed to the national grazing capacity, probably more in terms of pasture than rangeland. Cheap fertilizer prices were another factor in expanding pasture production. Supplementing those production factors was a strong demand, market and prices for beef cattle through most of the growth period and relatively lower prices for grain.

### Recent Trends 1976-1983

#### Beef Demand

Since 1976 per capita beef consumption has declined to 79 pounds. Beef consumption as a percent of total per capita meat consumption has fallen to its 1960 level, while total meat consumption per person has remained stable between 200 and 210 pounds per year.

This drop in beef demand occurred while U.S. population increased and per capita disposal real income rose. Beef prices in real terms dropped. Normally, these changes in demand factors would work to increase per capita and total demand. So, the drop in beef demand is all the more striking. Some people tend to attribute this decline in beef demand to growing concerns about adverse health and nutrition influences associated with beef consumption. These consumer concerns apparently were real and no doubt had some bear-

ing on the demand shift. The beef industry now appears to recognize a need to address these consumer concerns and to do a better job of marketing its products.

Pork retail prices dropped sharply after 1976 both in real terms and in relation to beef prices. Total pork production expanded rapidly and reached an historic peak in 1980. From 1975 to 1980 the pork share of total per capita meat consumption increased while the beef share declined (Fig. 1).

The decline in chicken prices, both in real terms and as a percent of retail beef prices, accelerated in the same period (Fig. 2). The poultry share of total per capita meat consumption rose from 25 percent to 29 percent. Total poultry production reached an historic peak in 1983.

The price trends and consumption responses among the competing meat products, make it difficult to separate the impact of health and nutrition concerns from the influence of prices on the demand for beef. However, there is a widening understanding growing both inside and outside the meat and beef industries that they are "mature" industries. This is based on the fact that total per capita meat consumption from 1967 to 1983 has remained between 200 and 210 pounds except for 1973 and 1975 (Fig. 1). It means that steady growth in meat demand and increases in per capita consumption appear to be over for beef and the meat industry generally. For mature industries growth in demand is dependent entirely upon population growth. Thus, changes in per capita demand for beef will depend largely on its ability to compete with pork and poultry and other protein alternatives for a greater share of the market.

#### Range and Pasture Use

With the decline in beef demand, range use was also reduced in all major producing regions. Total cattle numbers fell from 132 million in 1975 to less than 111 million in 1979. There was a short recovery to 115.6 million head in January 1982 and then the number declined to 113.7 million in 1984 (Table 1). Beef cow numbers declined more rapidly than all cattle: 18 percent from 1975 compared to 14 percent for all cattle.

In January 1984, W.J. Waldrip had this to say about the size of the cattle herd in his Presidential address to the National Cattlemen's Association:

Because of the adverse economics in our industry, we are now seeing another cutback in numbers of beef cows and in total cattle numbers. One question is how much further numbers have to be reduced before more cattlemen can make profits more consistently. One analyst said that, given historic relationships of supplies and prices and costs, annual per capita supplies of beef would have to be cut back to about 74 lbs., retail weight, compared with 78 lbs. in 1983. That would mean only about 105 million head of cattle on farms, compared with 115 million in 1983. We would have to liquidate another 10 million head, including 4 million beef cows.

The decline in beef cow numbers and range use from 1975 to 1984 was greater in the East than the West as shown in Table 2. The decline also appears to be greater on the improved pastures in the East and Northern plains than on the rangelands of the Southern Plains and Far West. Part of this is associated with the increase in fertilizer prices. Part may be due to a shift of the better pastureland into crops as crop demands and prices improved in the 1970's. However, there remains some unused range capacity in the Far West and

**Table 2. Regional beef cow distribution, 1970-1984. Source: USDA.**

Year	Western Regions				East	Total
	Far West (11 States)	Southern Plains (2 States)	Northern Plains (4 States)	Subtotal (17 States)	(31 States)	(48 States)
1970	7.4	7.6	6.0	21.0	15.6	36.6
1975	8.3	9.6	7.8	25.7	19.9	45.6
1980	7.0	7.7	6.1	20.8	16.2	37.0
1982	7.7	8.3	6.5	22.5	16.8	39.3
1984	7.5	8.2	6.3	22.0	15.5	37.5
1984 as % of 1975	90	85	81	86	78	82

Southern Plains compared to the herds carried in 1975.<sup>1</sup>

Total rangeland in this period of declining cattle herd is only slightly reduced, less than 0.5 percent below the 1977 level. Range conditions are about the same, maybe slightly better according to preliminary results from the 1982 National Resource Inventory. Pasture land area has not changed. Thirty-two percent of the pasture was rated good, 40 percent fair, 19 percent poor and 9 percent native, largely unmanaged grasses. The 1982 pasture condition data are not strictly comparable with the information available for 1977. However, other 1982 National Resource Inventory data on pasture conditions suggest some improvement since 1977.

To sum up the 1975 to 1984 trends, it appears that the demonstrated capacity in rangeland and pasture is for about 132 million cattle. Current demand and use is about 86 percent of that demonstrated capacity. In terms of beef cow numbers, the utilization is closer to 82 percent. Industry economics suggests that cattle numbers should be reduced to about 105 million head to improve the profitability of beef cattle production in current markets. Range and pasture conditions have been maintained or improved overall while the demand for range and pasture use declined 14 to 18 percent from 1975. Current January 1985 USDA data on cattle numbers show further significant reductions in the cattle herd and beef cows: 109.8 million and 35.9 million, respectively. Not all this reduction is attributable to economic conditions. Some is the result of severe drought in the West.

### Future Outlook

For mature industries, growth in demand is dependent entirely on population growth. For the United States, the Census projects population to grow about 0.8 percent per year to 2000. Using the 1984 cattle numbers as a starting point, that population growth translates into 120 million cattle in 1990 and 130 million in 2000.

Mr. Waldrip of the National Cattlemen's Association cited a lower herd size to sustain an economically efficient cattle industry at recent demand and price levels. He suggested 105 million. A level intermediate with that for 1984, such as 110 million, may be a more reasonable average level to allow for cattle cycle variation. This alternative base level would project to a herd size of 115 million in 1990 and 125 million in 2000.

<sup>1</sup>Data released by USDA on February 11, 1985, show January 1, 1985, total cattle on farms as 109.8 million and beef cows at 35.9 million. The reduction has been attributed to continuing self-off of breeding animals due to low profit, drought, and heavy debts.

These estimates of future cattle herd size needs are within the range and pasture forage capacity demonstrated by the cattle numbers in 1975, 132 million. They are also consistent with the Economic Research Service estimate of present U.S. forage capacity; at optimum use levels, the current capacity could sustain 120 to 124 million head.

### Influence of Productivity Improvements

There are expected improvements on the supply side that will tend to increase forage capacity or supply relative to the demands projected above. Soil Conservation Service planning for the 1989 update of the Soil and Water Resource Conservation Act appraisal is assuming a range forage productivity improvement of 0.7 percent per year. Range forage appears to support about half or somewhat more of the beef cow herd. If that productivity is realized, it would meet about half of the increase in demand. If that improvement also applies to improved pastures, it would meet practically all the projected increase in forage demand to the year 2000.

The leaders in the beef cattle industry are advising cattlemen that the priority need in meeting market competition against beef is to improve efficiencies. W.J. Waldrip said it this way:

Cattlemen get turned off when we talk about efficiency, but the fact is that each of us must improve his efficiency, so that we as individuals can compete more effectively within the beef business, and so that we as an industry can compete more effectively with the producers of other foods.

If we really subscribe to the concept of free enterprise, then we will have to become more competitive within that system. In a commodity business, where we do not control supply, where we are producing products that are not differentiated by brand, we as individual cattlemen have no choice but to become more efficient.

New research and technology can help the industry in total improve its efficiency. But we as individuals, competing with a million other producers of cattle—not all of whom are in the business really to make profits—must become better managers, more effective producers and marketers.

I expect that this advice will be heeded by the commercial beef cattle producers and should contribute to a lower cost of production in the future. Forage productivity improvement will be a part of that package.

Another part of that improvement will be greater beef cattle efficiency in reproduction and meat production. At the recent Soil Conservation Service Symposium on Agricultural Technology, animal scientists projected that meat marketed per cow can be expected to increase 25 percent by 2000 and 60 percent by 2030, about one percent per year. That estimate may be high but the direction is probably right.

In addition to projected productivity improvements, we can expect some cropland to shift back to grass in the next decade. The summing up of these expectations and the current capacity leads one to conclude that forage capacity through the year 2000 and probably somewhat beyond will generally be more than equal to the projected demands for a mature cattle and beef industry.

### Alternative Outlooks

The foregoing outlook reflects the current conventional wisdom that the beef industry is a mature industry and that per capita consumption of beef and all meats will remain constant. There are different views. A Chase Econometrics model predicts that per capita meat consumption will increase by nine pounds in the next decade. This is projected as a response to higher per capita real incomes. However, the largest share of that increase is allocated to poultry consumption rather than red meat. Thus, the relative role of beef in the diet would be reduced. Improvements in beef productivity and related reduction in production costs and prices relative to poultry and pork could improve this demand prospect for beef.

The Economic Research Service projects some decline in per capita beef production to 2000. However, it is less than population and export growth in demand, so total production rises a little to 2000, about 8 percent—not enough to tax current capacity and certainly not any improved level of capacity.

Another analyst projects a long-term decline in the cattle industry. He is Glenn Grimes, livestock economist at the University of Missouri. He attributes the decline to diet and health concerns among consumers and continuing profitability problems in beef cattle production. His projection indicates a possible redirection of the cattle herd to less than 100 million head.

The diet/health aspects of red meat consumption will continue to be controversial. Dietary authorities now seem to agree that the level of fat in the American diet is too high and should be reduced, at least as a means of curbing overweight. The USDA Human Nutrition Information Service continues to suggest that people can control calories and reduce in their diets by choosing lean types of meat, by trimming off excess fat, and by broiling, baking, and boiling meat rather than frying it. There is growing recognition in both the beef and pork industries that they need to become more involved in the diet and health discussions relating to red meat consumption. The issue is not going to go away. J.D. Waldrip expressed it this way. "We must expand our beef research, education and promotion programs. Unless we show how beef can fit in with modern consumer trends, we cannot expect to hold our already large share of consumers' meat dollars."

### Other Related Considerations

A recent USDA study, Conversion of Southern Crop-land to Southern Pine Tree Plantings: Conversion for Conservation, has estimated there are 13-15 million acres of marginal cropland and pasture in 9 states of the South where tree crops can produce higher net earnings per acre than beef

cattle. Pasture constituted two-thirds of those acres. A shift away from pasture use of this scale would reduce the present beef cattle herd in the South and shift production to the West. A continued high cost of fertilizer could contribute to that shift. That would increase the demand for range grazing in the West.

Crop and pasture returns from the USDA study were based on production budgets developed by the Economic Research Service and the assumption of constant real prices. The analyses showed only modest and in most cases negative annual net returns from crop and forage use. With rising real prices for softwood timber, the historical and projected trend, the estimate of marginal land increased to 17 million acres, including 11 million acres of pasture. The entire 17 million acres occurs on soils that have been classified by the Soil Conservation Service as marginal for crop use.

The estimated rate of return on the direct pine tree investment costs was 12 percent before taxes and inflation and with constant 1979 real prices. The direct costs were \$47 per acre for tree planting and an early stand treatment. This is less than half the cost of reforestation on harvested forested lands and, therefore, twice as cost effective in wood production. Tax credits and incentives are available to reduce the net investment up to 40 percent. Timber demands are expected to grow substantially in the South. So, the demand for conversion of marginal cropland and pasture to productive pine tree investments should grow.

There is also a demand among wildlife interests to intensify use of public rangelands for wildlife. Some wildlife interests claim higher net values to society for such a shift, especially where public costs of grazing programs exceed Federal revenues. Such a shift in use would also tend to increase range grazing demands on private lands, primarily in the West.

There will be other shifts of land in and out of range use due to changes in water supplies and urbanization. These shifts are not likely to become significant nationally in terms of demand pressure on grazing land before 2000 and perhaps not even then.

Because there are few alternative uses for grazing lands, all of the range will tend to be grazed for lack of a better use. Some part of this will be more or less marginal use which fulfills the lifestyle demands of the rangeland owners to remain ranchers while producing beef for the market.

Exports are increasing. One forecast expects about 10 percent increase per year which is 0.1 percent of total production. This has only a small impact on range grazing. Also, there is the possibility that the length of grazing will increase relative to the time on feed. That would increase range and pasture demands and take up some of the unused capacity. If the meat production from this production adjustment will meet the changing consumer tastes and preferences and reduce costs of production that appears to be good economics and a way to go.



### Some Questions/Implications for Range Conservation

The foregoing overview and outlook raises some questions and implications for the Federal role in range conservation in the next decade or two.

Where and to what extent should Federal assistance for range conservation be directed and provided in view of the adequacy of production capacity for the next two decades or so? How would improvements in productivity contribute to national welfare, affect the economic problems of the industry, and influence production among producers and among production areas?

Should Federal range conservation efforts encourage shifts from pasture and range use to softwood timber crops or other uses where the latter are viable and more economic? What are the types of range conservation problems that have the highest priority for Federal technical assistance?

To what extent should monitoring range conditions and productivity be the lead role? To what extent should the Soil Conservation Service National Resource Inventory be used to identify for state and local communities the range areas where continued grazing may be destructive of soil and related off-site resources? What changes are needed, if any, in the National Resource Inventory as it relates to rangeland and pasture? What analytic improvements are needed to provide a more reliable understanding of soils, soil stability and erosion problem on rangelands?

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