



*Maintaining the Competitive Edge*

*in*

*California's Beef Industry*

*Sponsored by the  
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Agricultural Issues Center*



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*in*

## *California's Beef Industry*

UC Agricultural Issues Center  
Study Group

James Cothern, Study Group Chairman  
Agricultural Economist  
California State University, Fresno

W. James Clawson  
Extension Range Specialist  
University of California, Davis

Gerald Horner  
Consultant  
Horner and Associates

Dan Drake  
Farm Advisor, Siskiyou County  
UC Cooperative Extension

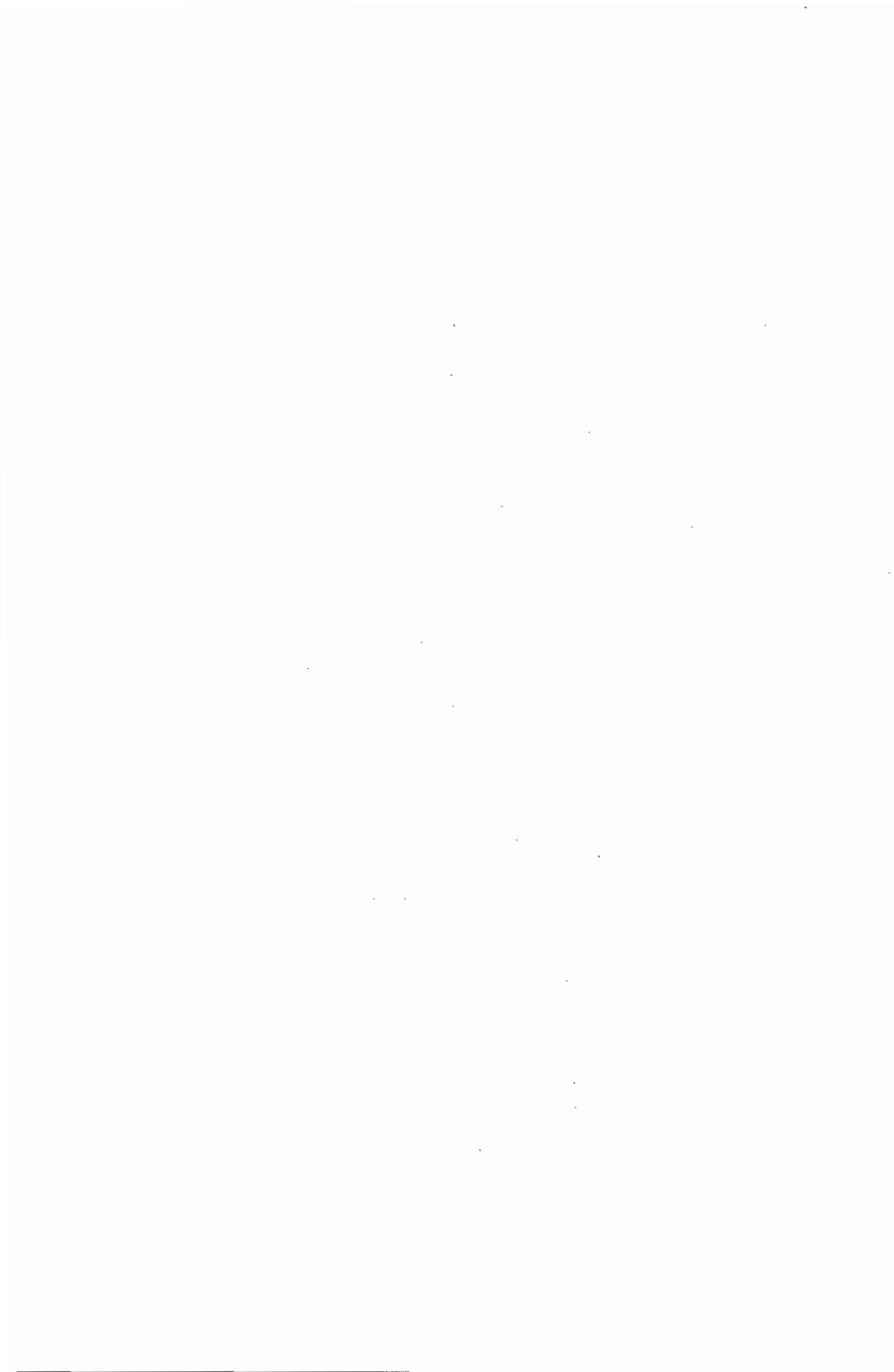
Chris Nelson  
Ranch Manager  
San Felipe Ranch

Gregory Greenwood  
Department of Forestry and  
Fire Protection  
State of California

James Oltjen  
Animal Management  
Specialist  
University of California, Davis

Julie Spezia  
Analyst  
UC Agricultural Issues Center

*May, 1991*



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## Preface

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I am pleased to present the first of the UC Agricultural Issues Center's series of competitive edge reports, *Maintaining the Competitive Edge in California's Beef Industry*.

This report points to the multi-dimensional nature of the challenges confronting the beef industry in California. It clarifies the issues and opportunities shaping the future for the state's cattle ranchers.

The UC Agricultural Issues Center launched this series to provide a forum for evaluating the competitiveness of California agriculture. Each report will focus on the current trends and longer-run outlook for a California commodity or group of similar commodities. This report was prepared by a cross-disciplinary team of eight experts, knowledgeable about the industry.

The UC Division of Agriculture and Natural Resources is committed to fostering an understanding of the forces which affect the state's natural resources and agricultural prosperity. It is my hope that this document will stimulate discussion of the beef industry and contribute to a competitive beef industry into the future.

Kenneth Farrell  
Vice President  
UC Division of Agriculture and Natural Resources

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## Acknowledgements

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This report is the product of a collaborative effort—in carrying out the project the study group relied on the knowledge and insights of a number of organizations and individuals. We gratefully acknowledge their assistance.

John Braley, and the staff at the California Cattlemen's Association gave their time and expertise. Jane Anderson with the California Beef Council and Anne Chadwick of the Chadwick Company provided additional information.

We were also assisted by other UC faculty and staff including: Julian Alston, Tu Jarvis, Andrew Schmitz, Francine Bradley, Christine Bruhn, Bees Butler, Colin Carter and Susan Casement.

We extend special thanks to Gordon King, Less Guthrie, and John Braley for their careful review of this report.

Finally, the Beef Study Group commends the UC Agricultural Issues Center Staff for their contributions. Ray Coppock served as editor. John Woolcott and Sandy Fisher assisted in many ways.



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## EXECUTIVE SUMMARY

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Technological breakthroughs in beef processing and marketing transformed the beef industry in recent years from a regional orientation to an international one. California's beef industry changed as well, with downsizing in the packing and feeding segments.

The California beef industry remains a large and economically significant industry. The 1989 value of its beef production was \$1.25 billion and will be higher in 1990. The combined value of California's beef and dairy cattle inventory amounted to about \$3.6 billion on January 1, 1990. But while the value of the industry is significant, the state's beef industry faces a number of challenges to its competitiveness—some shared with the industry elsewhere, some uniquely its own. Highlights:

- The trend is toward reduced consumer demand for traditional beef products, resulting partly from poultry's competition and partly from consumer health concerns. New approaches to the beef grading system, with its effects on consumer demand, are needed.
- Public food safety concerns are minimal for beef, but should be addressed.
- Animal welfare issues will have more impact on concentrated animal populations than on the range beef industry, but will need attention.
- California's position on the Pacific Rim offers a limited possibility of more sales abroad, especially in Japan.
- California's vast and productive rangeland resource is its chief competitive advantage. Now it is threatened by population growth, by conversion to other uses, by environmental regulation, by management problems, and by water quality problems. The possibility of too-intensive grazing in some areas must be addressed.
- In the future, California's varied and flexible beef producing possibilities, combined with increasing market specialization, will place a premium on sophisticated, integrated production systems. Labor management, financial and risk management and innovative feedstuffs will be particularly important.



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## Introduction

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Changing information and communication systems coupled with people's busy lifestyles are creating an ever more dynamic and increasingly competitive marketplace for the food industry. Already developments such as fat substitutes and microwave ovens have dramatically affected the composition and form of food products. Consumers have become accustomed to an increasing number of food choices. However, there are relatively few new choices in beef products.

At the same time, beef faces increased competition from chicken to capture what restaurant marketers call "the center of the plate," or the protein choice for dinner. Two factors explain poultry's improved competitive position: greater production efficiency, and greater demand due to perceived health benefits.

Institutional change is underway as well. The opening of markets in Eastern Europe, potential Asian markets, the proposed Mexico Free Trade Agreement and the potential modification of GATT policies promise opportunities in international food products marketing. Nationally, the beef cattle industry is impacted not only by economic trends but the secondary effects of U.S. farm policy such as the "cheap grain" policy.

In California, resource and regulatory issues are challenging beef cattle management. Cattlemen's practices are being scrutinized by environmentalists and government regulators, food safety advocates, animal rights activists, and the general public as influenced by these groups. Ranch management is complicated by increased competition for labor, capital, land and water. With these pressures, producers are having a tougher time making a profit.

This is the context in which we discuss the future competitiveness of California's beef cattle industry. We will describe the recent transformation in the beef industry and provide background

information to clarify the trends and issues challenging the industry's competitiveness. These include consumer preferences and market trends, natural resource-use and environmental constraints, and regulations. In preparing this report, we adopted a long-term outlook, rather than focusing on the immediate problems producers face today. In the final section, we discuss the most important issues challenging the industry and its allies in maintaining or improving the California beef cattle industry's competitive edge.

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## Brief Description of the Beef Cattle Industry

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Cattle have grazed in California since the Spanish drove their herds from Mexico to this state's coastal rangelands to feed the mission communities. Over the years the viability of California beef cattle production has been challenged repeatedly. In the 1860s, the state shifted from livestock grazing to farming as its major agricultural activity. As water became more available to crop producers, cattle and other livestock activities were pushed onto the foothill lands which are unsuitable for cultivation. This competition for resources—affordable land, clean air and abundant water—continues; however, beef cattle producers are now competing for these resources with developers, recreational users, individual home buyers and retirees as well as dairymen and crop producers.

To understand the issues confronting cattlemen, we need to understand the structure of the national beef industry and California's role in it.

### The Structure of the Beef Industry

Consumers expect their local grocery store to provide a variety of beef cuts at the meat counter for a reasonable cost. They have limited knowledge of the beef industry and the process by which steak or hamburger gets to market. The "beef industry" is actually a convenient term for a number of industry segments: cow-calf, stocker, feeding, and packing sectors.

Beef cow-calf operators provide the basic ingredient, producing about three-fourths of the animals used by the rest of the industry segments. The other one-fourth comes from the dairy industry and imports. Once calves from a commercial cow herd are weaned, they may remain with the cow-calf operator or be sold to stocker operators or feeders. Stocker operators purchase young animals, use them to harvest seasonal forage supplies, and sell them at the end of the forage season or when the market dictates.

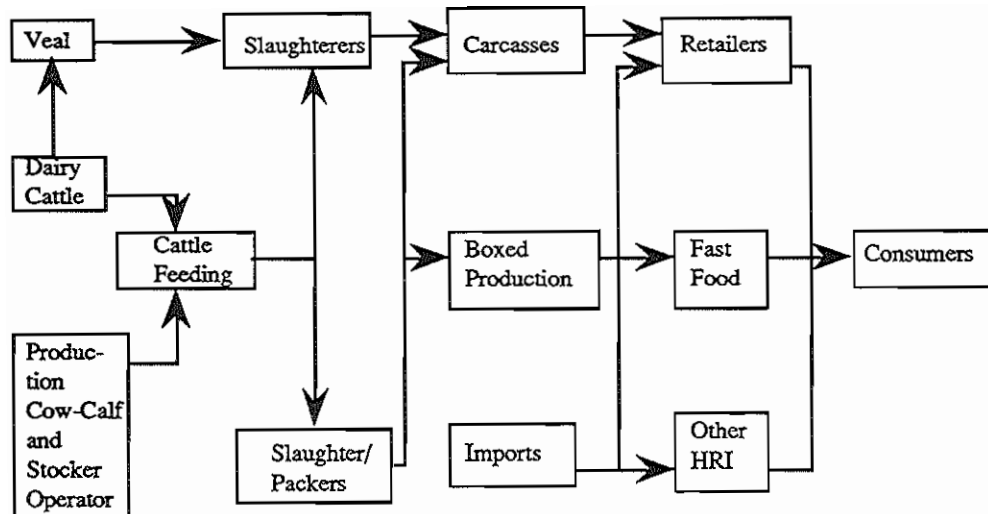


Figure 1. Production and Marketing Channels for California Beef

The number of “stoker” cattle dips during times of drought in California, but stoker production returns once the feed and water supplies are replenished. Cattle feeders “finish” an animal—feeding for desired end weight. Some cattle feeders also have packing operations; others do not. The term “packers” refers to those engaged in slaughter and packing operations for eventual sale to retail markets. Their beef products reach consumers either through the retail grocery, fast food, or hotel, restaurant and institutional (HRI) outlets.

The U.S. beef cattle producer may have a wide screen “cattle baron” image, but in fact the industry is comprised of a relatively large number of small operators. Many are part-time ranchers. The beef producing sector is competitive, since it is relatively easy to enter the market by buying a few cows, and leasing irrigated pasture or range. This ease of entry and exit, coupled with leads and lags in production and marketing, results in the chronic boom and bust tendency prevalent in the industry.

### The Cattle Cycle

Numbers of cattle in the domestic herd have traditionally expanded and contracted in relatively regular 10-14 year intervals—the “cattle cycle”. While each cycle is different, characteristics of past cycles are worth noting, particularly when attempting to predict the future. The cyclical tendencies in the industry reflect the nature of the reproductive process, with a lag of two and a half years between the decision to breed a mother cow and the calf’s ultimate marketing. As a general rule, producers are less likely to

retain breeding stock during periods of slow or moderate economic growth and low inflation; conversely, during periods of high inflation and when fiscal measures are used to stimulate investment, producers tend to rapidly expand their herds.

In addition, certain artificial inducements have historically prompted expansion or liquidation—for example, fiscal policies that result in investor entry for tax savings rather than for economic return on an investment. However, tax reforms have eliminated many of the passive shelters that existed in the industry during the 1970-80 decade. Currently, proposed capital gains legislation has the most potential for distorting the near and longer term investment pattern in breeding cattle operations.

If we look at the cattle numbers since 1955, we see the last two herd peaks occurred in 1975 and 1982 (see Figure 2). The national herd expanded steadily through 1975 as a growing domestic population and rising consumer incomes increased beef product demand and growth in all facets of the industry. The subsequent reduction in herd was prompted by the OPEC oil embargo and its related economic fallout. The herd began to build again in 1979, but after a modest increase, peaked again in 1982. It is now apparent that the 1975 peak marked a significant turning point. Prior to 1975, the herd steadily increased in spite of cattle cycle expansion and contraction; however, since 1975 the size of the national beef herd has declined. This long-term contraction in cattle numbers created overcapacity in the feedlot and packing sectors. For January 1, 1991, total cattle numbers were estimated at 99.4 million.

Meanwhile, productivity increased in all sectors due to improved management and technology. Today approximately 2 percent less beef is produced with 27 percent fewer cattle than in 1975. The decline in numbers is due to the shrinking dairy cattle herd and higher productivity (management and technology). The marketplace is volatile and the only constant in the industry is continual change.

Total Cattle Numbers: Jan. 1  
-1000 Head-

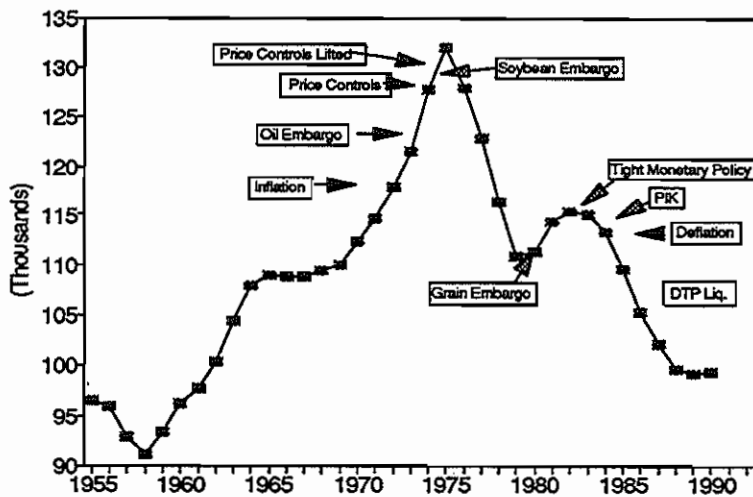


Figure 2.

### *Composition of the National Market*

The dominant portion of U.S. beef supply is derived from the national beef cow herd. The national dairy herd interacts with the beef cattle industry; every year about one half of dairy calves and one third of the dairy cow herd go to hamburger or veal. The imported portion of beef supply varies but typically has accounted for about 11-18 percent of the total.

The national beef herd is comprised of feedlot cattle, non-fed steers and heifers, cull cows and slaughter bulls. Feedlot cattle are the source of most of the table-ready cuts and a portion of each animal is used as ground beef or for other processed products. Non-fed steers and heifers, cull cows and slaughter bulls provide most processed products and are used mainly for ground beef. Changes in the composition of slaughter are associated generally with changes in economic fortunes of the industry. When times are hard a larger proportion of total kill is composed of cows and non-fed steers and heifers. Both of these categories decrease when economic times improve and ranchers hold back animals for breeding replacements.

The term "non-fed" beef applies to all cattle not raised in confined cattle feeding operations for extended periods of time, including: grass fed beef, dairy culls and bull calves, and imports. Most of the non-fed beef supply is used in the fast food and retail industries as ground beef, but not all ground beef is from non-fed beef. Total ground beef output is substantially augmented from lean meat trim from fed cattle. A review of the data since 1970 indicates surprisingly constant ground beef production proportions. The distortions occur when herd liquidation takes place or when pronounced herd rebuilding strategies are invoked. Most imports are non-fed cattle from New Zealand and Australia. The US Meat Import Law has stabilized sources of supply from abroad.

The Meat Import Law allows the U.S. to impose import quotas if fresh, chilled, or frozen meat imports exceed an established level. The 1990 trigger level was 1,366 million pounds in product weight. Some countries and some products are exempt.

The Meat Import Law stabilizes the amount of imports. The U.S. is expected to continue to be a net beef importing country for the foreseeable future. Imports during 1989 amounted to 2.2 billion pounds and about three-fourths of this came from Australia and New Zealand.

### *Geographic Location of the National Herd*

The United States Department of Agriculture (USDA) geographically separates the U.S. into ten producing regions (see Figure 3). Four regions comprising the western half of the United States are thought of as being the wellspring of beef cattle production, but actually beef cattle enterprises are a national endeavor since a large number of beef cattle operations are present in virtually every state. Typically, about 15-20 percent of the national inventory is in the 11 western states usually referred to as the Pacific and Mountain regions.

Each geographic region has its own distinct production and operating characteristics, largely dictated by availability of forage and feed grains and by weather conditions. The 17 western states might be depicted as specializing in traditional land-extensive grazing operations, while the eastern U.S. is portrayed as using more land-intensive grazing, crop residue or a combination of both. Since about 75 percent of national feed grains supplies are produced in the Corn Belt, beef growing and finishing operations in that region dominate national production.

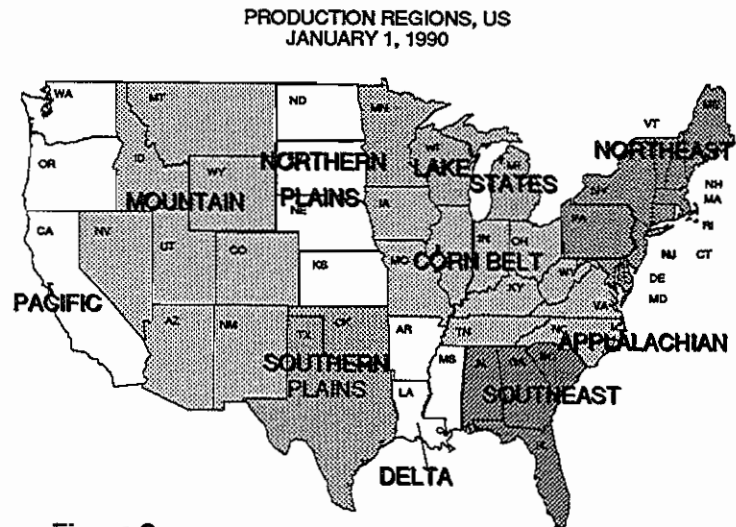


Figure 3.

### Changing National Market Characteristics

Thirty-five years ago, markets for cattle and beef products tended to be local or regional in nature; a beef steer might be born and butchered in Northern California. However, the beef packing industry changed fundamentally with the advent of improvements in packaging, storage technology, and transportation systems. Distances between markets are now measured in time rather than distance—a 40 hour differential will bridge most markets in the United States. Live fed-cattle and feeders still tend to be marketed in local or regional patterns, but the marketing of beef products has been transformed from local-regional to national-international.

Vacuum pack technology made this transformation possible. In the early 1980s, IBP was the first packer to adopt this technology and begin marketing boxed beef. In ten years the standard beef product has changed from a beef carcass to a 65-75 pound primal cut, vacuum packed and boxed.

This development has changed the process of pricing. The auction price, or live cattle price, is derived from the price that packers receive for boxed beef (carcass equivalent). Since boxing technology dominates the industry, the boxed product undergirds wholesale pricing and influences industry practices in other ways. The long-term trend among producers has been to feed for a 600-800 pound carcass, the weight desired for boxing. This discriminates against the finishing of large framed breeds yielding leaner and heavier carcass weights like those in California.

The advent of boxed beef also changed the retail sector's beef procurement and marketing practices in the last decade. The larger grocery chains used to buy carcasses and distribute primal or sub-primal portions through a divisional warehouse. Individual stores processed and packaged these portions into final retail form. But now packers are breaking carcasses into primals, sub-primals and smaller portions at the plant, eliminating the need for central warehouses and/or cutting facilities. Differentiated product can now be shipped directly from the packer to the retail market or central storage facility. The process also extends the storage life of beef and reduces the weight loss, or "shrink" which normally occurs when a carcass hangs in a cooler. Beef in the box can be stored for 6-8 weeks.

While product quality improved, boxed beef also resulted in fewer packers with more packer control in price negotiations between packers, wholesalers, and retailers. In fact, the wholesale market is now dominated by three major beef packers. In 1989, ConAgra, Excel (Cargill), and IBP processed approximately 64 percent of the fed cattle in the nation and marketed more than 80 percent of "boxed beef." Compare this to 1980 when the four largest packers processed 36 percent of fed cattle and marketed 53 percent of the boxed beef. Beef producers express concern over this packing industry consolidation; the associated issues are discussed thoroughly in other publications.

For Further Reading:  
*Beef in a Competitive World*,  
Final Report of the NCA  
Beef Industry Concentration/  
Integration Task Force. Prepared for the  
National Cattlemen's  
Association Executive  
Committee, October 25,  
1989.

To remain profitable, packers have enlarged plant capacity and relocated near concentrations of feedlots. Most cattle are purchased within 200 miles of a slaughter plant in order to avoid dehydration and shrinkage and to ensure timely delivery. Thus, packer procurement is far more localized than processed beef marketing. Most of the nation's fed cattle are now procured and slaughtered in a narrow area of the Western Corn Belt and the Oklahoma-Texas Panhandle regions. The Eastern Corn Belt is of declining importance and the California-Arizona region, once a dominant area, is fighting to remain viable. This trend will continue in the future. Furthermore, by the end of the decade, even fewer packers will remain.

#### *Relative Changes in Feedlot Numbers and Output*

Another part of the cattle industry showing the effects of continued competition is the feeding sector. In 1968, there were more than 135,000 feedlots in the 13 major cattle feeding states, marketing about 19.6 million animals. In 1980, the number of feedlots had decreased to about 78,000, but the number of animals marketed actually increased to more than 21 million. The 1990 census indicates that this trend is continuing, with about 44,000 feedlots marketing about 22.6 million head.

Feedlot size is increasing because successful feedlots tend to be large, specialized and geared to the needs of major packing firms. Feeding is a capital intensive enterprise; larger feeders have access to greater amounts of capital at relatively lower interest rates than smaller firms. These firms also are better able to assume and manage price and production risks.

Growth in the cattle feeding industry is concentrating in specific geographic areas, most notably Colorado, Kansas, Nebraska and Texas (see Figure 4). Texas feedlots alone increased output from about 2 million head in 1968 to 4.84 million head in 1990—about 17 percent of total U.S. output. For each of these “winners” there were obvious “losers”. Two of the largest “losers” are Iowa where fed cattle marketings dropped from 4.5 million head in 1968 to 1.86 million in 1990, and California where aggregate state marketings declined from about 2 million head to 825,000 during those years.

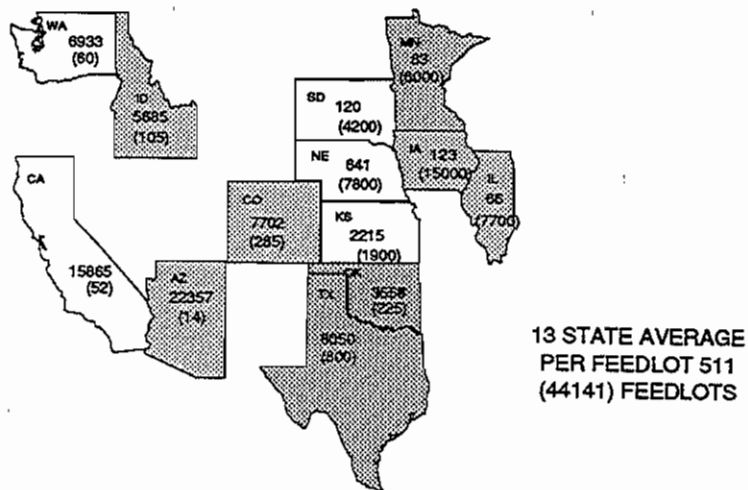


Figure 4. Average Number of Cattle Marketed per Feedlot (Number of Feedlots), 1990.

### Cow-calf Operations

The cow-calf sector will be next to consolidate. The numbers of cows will remain relatively stable, but most animals will concentrate in the hands of a few large operators. The trend will be for low-cost producers to survive; those unable to compete will exit and their production assets will be accumulated by the survivors. The survivors will be both larger operators with access to capital and small, part-time operators with a supplemental income.

Over the last decade, ranchers have tended to accept a low return to labor, capital and management in the short run, meanwhile depending on increased value of the inventory (land, cattle and other capital) to provide a positive return, or savings, in the longer term. The government’s monetary policy to control inflation has at times negatively influenced this operational pattern, through rising interest rates and associated credit costs.

The current herd expansion has been much more modest and less subject to inflationary pressures than previous growth periods, thus resulting in a much slower growth rate. The most immediate result of the current relative well-being of the industry has been bid prices for breeding cattle beyond their apparent re-

Typical western cow-calf budgets, including those computed for California situations, show rising fixed expenses (taxes, interest and general farm overhead), increased costs for pasture and range and a general increase in other costs. However, rising calf, yearling and cow prices have more than offset these trends during the 1985-92 period. Nevertheless, overall budget results indicate that cattle ranchers in the U.S., the West and in California are not earning a sufficient return over time to cover all costs under existing price-cost levels.

payment capacity—a phenomenon that may cause problems for those who are expanding herds under current economic conditions.

### *Industry Integration*

The poultry industry began integrating its processing plants, hatcheries and feed mills in the 1950s. Processors contracted with chicken farmers to keep plants at full capacity; poultry breeders now produce birds with better feed efficiency and faster growth rate. These changes enable the poultry industry to offer a lower cost product.

Because of increased competition and narrower profit margins, packers and feeders have begun to integrate their operations as a way to reduce risk and increase marketing efficiency. Integration enabled the poultry industry to be more responsive to consumer preferences; it may have the same positive impact on the beef industry.

Industry integration is largely through contractual alignment between packers and feeders. As with the poultry industry, integrators find it easier to work with fewer, larger operators geared to volume. While packers are no longer legally prohibited from owning feeding operations, it is easier and less expensive to integrate by contracting with feeders. Feeders are also exploring backward integration with stocker operations as a means of guaranteeing quantity and quality of supply. Cow-calf operations are less attractive to integrators because the large number of small, part-time cow-calf operators makes it difficult to coordinate production and eliminate time-lags between calving and marketing. Thus, integration will likely have more influence on the structure of beef cattle feeding and marketing than on the cow-calf industry.

## California's Beef Cattle Industry

The prior discussion describes current trends in the industry. What are the implications for the state's cattle producers? California's beef cattle industry is integrated into the national industry, with trends in California generally following national ones (Table 1). Differences that exist arise from cost of transportation, costs of production, and regional weather patterns. The two most pronounced different trends in California are the disappearance of packinghouses and feedlots, and the increasing flexibility of cattle operators.

### *Consolidation in the Industry*

Many California packers lacked sufficient volume, financial capital and initiative to exploit the market potential of boxed beef. They had the added disadvantage of relatively high labor costs, although that was not a major deterrent to more progressive action. Meanwhile, major Midwestern packers were penetrating California markets from greater distances, since their transportation costs were offset by greater economies of scale at slaughter. The California packers' market share eroded and the number of packers declined from 49 in 1978 to 36 in 1990. Only a small portion of these

Cattle & Calves Inventory, 1989 1,000 head		Cattle Slaughtered, 1990, 1000 head		Milk Cows that have calved, 1990	
1. Texas	13,600	Kansas	6,193	Wisconsin	1,760
2. Kansas	5,650	Nebraska	5,833	California	1,1115
3. Nebraska	5,500	Texas	5,586	New York	790
4. Oklahoma	5,150	Colorado	2,073	Minnesota	715
5. California	4,700	Iowa	1,793	Pennsylvania	694
6. Iowa	4,600	California	1,163		
7. Missouri	4,500	Wisconsin	1,098		
8. Wisconsin	4,130	Minnesota	1,007		
9. S. Dakota	3,480	Pennsylvania	955		
10. Colorado	2,850	Idaho	636		

**Table 1. Industry Rankings by State**  
Source: National Agricultural Statistics Service, USDA

kill more than 50,000 head per year—the equivalent of less than a month's kill in a major Midwestern packing plant.

The industry shift in processing technology from carcass to boxed beef has important ramifications. Today, boxed beef represents 70-80 percent of California's market share, with the carcass share at 20-30 percent. In the future, virtually all beef will be processed into boxed beef at central breaking facilities maintained by packers. The three major national packers who now control more than 80 percent of all beef in the box will become more powerful forces in price making behavior in national markets, and particularly in the West where few local packers remain to challenge their dominance.

The loss of California packing operations has challenged California cattle feeders. California feedlots have traditionally been markets for California cow-calf operators. Historically, about one-half the California cattle feeding capacity has been in the Southern Desert, with the remainder in the San Joaquin and Sacramento Valleys. Southern Desert operations have traditionally relied very heavily upon Southwestern, Southeastern and Mexican sources for feeder cattle supplies. While out-of-state competition continues to press these Southern California operators, proximity to relatively large and affluent consumer markets favor their continuance. However, competition has resulted in the exodus of less efficient lots and those with relatively high feed and facility costs.

Winter rain and wind reducing cattle's ability to gain, relatively high grain prices, and loss of packing facilities has eliminated all but a few, large specialized feedlots in the San Joaquin Valley, which has resulted in a loss of market opportunity for Northern California cow-calf and stocker operators. Also, intrastate transportation rates regulated by the Public Utilities Commission, mean

that some short hauls can be more costly than longer distance interstate hauls.

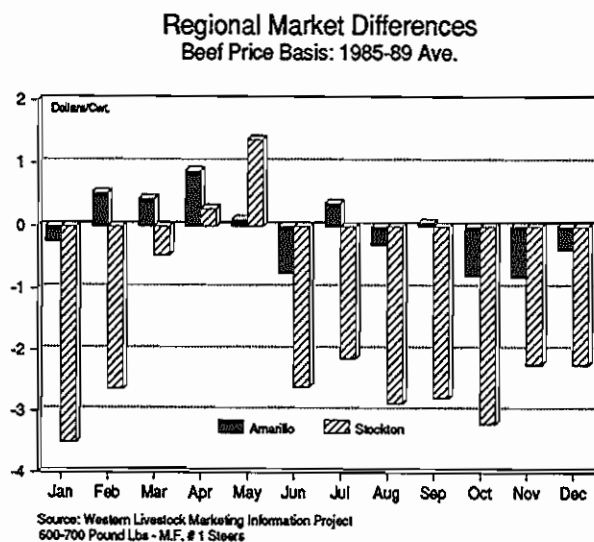
### Producer Options

California cattlemen have diverse and flexible operations. California's Mediterranean climate and annual grasslands give beef cattle producers a competitive advantage. More than half of the land area of the state provides forage which has the potential to be converted into beef for human consumption. While the value of production per acre is low, the large total number of acres makes this forage resource one of the more valuable crops produced in California.

Of the over 40 million acres of rangeland in California, slightly more than 23 million acres are in public ownership, and 18 million acres are privately owned. However, the privately owned rangelands are the most productive, providing 91 percent of the total amount of rangeland forage used in the state (13 million Animal Unit Months (AUMs) yearly). Over 10 million of these AUMs are derived from annual grasslands and valley-foothill hardwood ranges.

It is common for operators to buy stocker cattle out-of-state; ship them to California to harvest winter and spring grass; transport these animals out-of-state for finishing and processing; and then ship the resulting boxed product to California retail warehouses for distribution and consumption. This seemingly circular

process has evolved through the force of competition.



**Figure 5.**

Estimating basis is a real problem for a California rancher since basis is more variable than in markets like Amarillo which are nearer delivery points and centers of cattle feeding activity. Basis variability can effectively eliminate profit margins, particularly in those months when it is quite large.

Transportation costs and regional demand explain why the "basis" for California feeder prices often swings more widely than it does in the Mountain region and the Southwest. Basis is generally defined as the (location specific) difference between the cash market and the futures market at the time of delivery. Figure 5 portrays the difference between two markets, Stockton and Amarillo.

Stocker enterprises are a highly speculative venture, and cash flow needs are high. Profitability is determined by availability of feed, feed conversion efficiencies, and the relative animal purchase and sale prices. Evaluation of 1974-86 data indicates an average of about 1.4 million animals were transported to California annually for stocking, feeding or slaughter during those years. The annual total since then has probably been in the range of 1-1.2 million animals (compilation of inshipment data has been discontinued since 1986). Traditionally, more than 90 percent of all inshipments have been for stocking or for feeding rather than slaughter. The number of stocker cattle is variable and depends on weather and economic factors; drought has forced this segment of the industry to temporarily shrink by over 50 percent for the 1990-91 forage season. About half of the state's rangeland is used to support stockers, and often the more productive or improved range land fits this use pattern.

While the number of commercial cow-calf producers actually lost due to the financial shakeout of the past ten years is difficult to determine, California Agricultural Statistics Service (CASS) reported 18,000 operations in 1989. Average herd sizes continue to increase as the industry shakeout continues. About 15-18,000 operations in California seem to be the norm over time. However, CASS reported that 71 percent of the 1989 cattle inventory was in about 7.4 percent of the operations—those with more than 50 animals. CASS defines a beef enterprise as any entity with one animal or more; commercial operations have traditionally been defined as those with 100 head or more.

### *Cattle Production in California by Region*

California's total cattle herd is actually slightly larger today than ten years ago despite the slight decline of feeder and cow-calf operations. This is because the decline in these sectors has been more than offset by expansion in California's dairy industry. Unlike the rest of the nation, California's dairy herd has steadily increased, from 836,000 cows in 1978 to 1.12 million cows in 1990.

Historically, the largest concentration of dairy and beef animals has been in the San Joaquin Valley. During a benchmark 1974-86 period, about 29 percent of the state's beef cow herd and 55 percent of the dairy cow herd were in that particular area. Slightly over 89 percent of the state's beef herd has historically been counted in four state regions—San Joaquin, Central Coast, Northern Mountain and Northern Sacramento (see Figure 6). We expect the number of beef cows in those regions to decline, however, because several counties in these regions are subject to development and environmental pressures. These forces are expected to

have an impact on the location and magnitude of the future state herd.

The California beef cow herd has fluctuated from about 870,000 to more than 1 million animals during the past decade, and was estimated at 940,000 on January 1, 1991. These numbers, provided by CASS, are the most reliable numbers the industry has; however, as California enters the fifth year of drought, we can expect beef cow numbers to be further impacted.

### Change in Beef Cows by Region: 1979-90 (1000 Head)

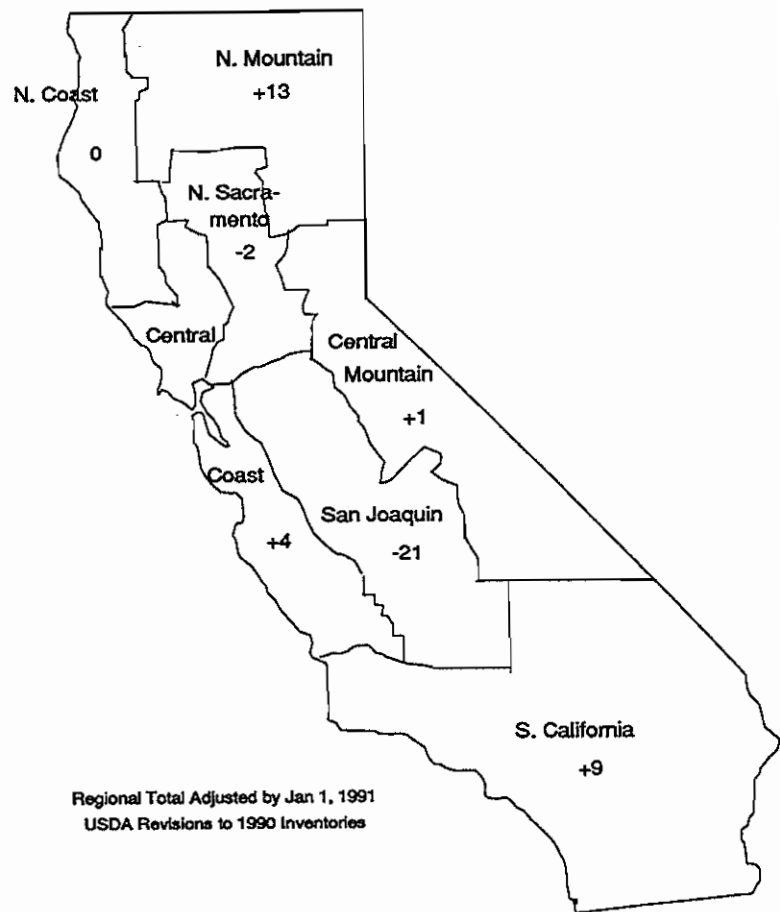


Figure 6.

California Crop and Livestock Reporting Service (Annual)

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## Challenges to Maintaining Competitiveness

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How can California's beef cattle industry maintain its competitive edge in a tough and constantly changing business climate? California is blessed with annual grasslands and a mild climate which gives it a comparative advantage over other states. However, the state's beef industry must cope with challenges such as changing consumer preferences, relocation of the feeding and packing industry, and competition for land and water. Federal and state regulations also impose costs on producers, and when they impact California's competitiveness in relation to other states they can force a contraction in the state's beef industry.

Two types of challenges face the beef industry: those affecting consumer demand, and those affecting ranchers' ability to produce cattle. We emphasize the issues especially important to this state's cattlemen, recognizing that producers in other states may be facing similar challenges.

### Challenge to the Beef Cattle Industry: Consumer Demand

Rising per capita consumption of poultry, fresh fruit and vegetables is challenging consumer demand for beef. Nothing portrays the change in consumer preferences as well as a comparison of proportionate consumption of beef and poultry over time (see Figure 7). In 1955, beef comprised about 39 percent of total meat consumption, pork tallied another 40 percent and poultry accounted for about 17 percent. In 1990, proportionate consumption of the three products was: beef—31 percent, pork—28 percent and poultry—41 percent.

Obviously, beef and pork have taken the biggest loss in market share. The persistence of this trend over time and under a variety of economic conditions is evidence of the permanence of these changes in tastes and preferences. The issue is not whether the loss is permanent, but rather, whether or not even greater market share losses will occur in the future.

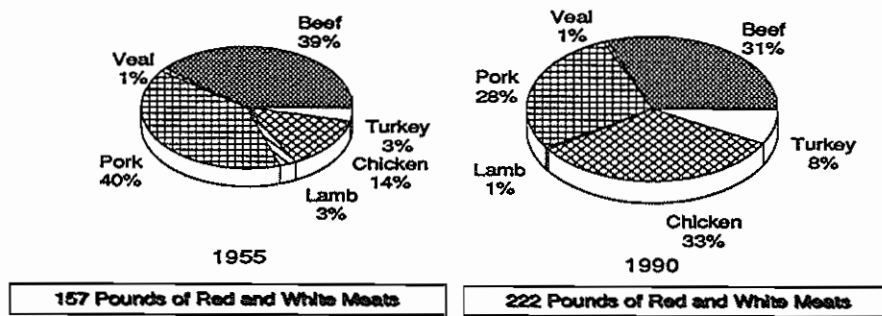


Figure 7. Per Capita Consumption, 1955 and 1990.

Consumers have been spending successively smaller proportions of their income on meat for several years due to rising disposable income and increased spending for durable goods and services. Not only is proportionately less of the household budget spent on food, but meat dollars are diverted from beef to fish and poultry. In addition, fresh fruit and vegetable consumption passed 100 pounds per person for the first time in 1989.

#### *What Has Caused the Change?*

Changes in price and changes in tastes, including health concerns, are factors affecting demand which explain the shift of consumer preference away from beef to poultry. Of these factors, poultry's relative price advantage over time is probably most important. It results from poultry's advantage over beef cattle in feed to meat conversion efficiency. Substantial gains have been made within cattle breeding programs to improve conversion efficiencies, but, ironically, market standards have been unable to accommodate these changes. The industry is moving slowly toward relying on consumer preferences to provide incentives for more change.

Reasons for changes in consumer preferences other than relative prices are health and convenience. Over the past two decades, diet has been associated with several of the major causes of death in the United States, including cancer, heart disease, diabetes and high blood pressure. Doctors and dieticians generally agree that the risk of certain diseases can be significantly reduced by controlling what we eat, and by balancing intake with regular exercise.

Caloric content of foods is an issue, especially the proportion of calories taken as fat. Cholesterol and fiber content are also of concern. Studies suggest that diet and health consciousness have been factors in causing women to shift consumption from foods

#### Accounting for Changes in Taste

Health concerns are thought by many to have shifted consumption away from red meats. However, agricultural economists Julian Alston and James Chalfant find that consumer preferences are in fact rather stable. They believe the shift in meat consumption patterns in the U.S. and Australia can be almost entirely explained using only relative prices and expenditures. This debate highlights the difficulty of measuring gradual and evolutionary change with traditional economic tools.

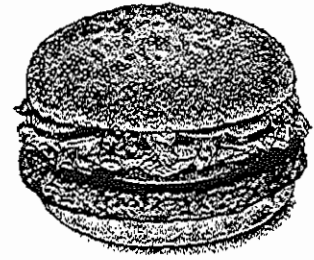
high in fats and cholesterol. This is an indicator of the level of increased awareness that consumers have about food's role in their environment. More and more, people are becoming aware of their blood cholesterol levels and other signposts of physiological well-being and are able to adjust their diet based on individual needs. This is, as one writer calls it, "the age of preventive eating."

The most recent *Dietary Guidelines for Americans* released by the USDA suggests maintaining a healthy weight, choosing a diet low in fat and cholesterol and eating moderate amounts of a variety of foods. Unfortunately, consumer understanding of information on nutrition is often superficial and incomplete, resulting in mental lists of "good" and "bad" foods which may lead to unnecessary elimination of foods from an individual's diet. In a recent Gallup survey, 45 percent of respondents said they are eliminating red meat from their diets due to health concerns. Ironically, fat consumption increased 27 percent between 1967 and 1988, as a 55 percent increase in consumption of vegetable fats more than offset a 32 percent decrease in butter and lard consumption.

Over 10,000 new food products were introduced in 1990. Many of these were familiar foods in new packages, but not many of them were beef. However, the trend towards increased convenience of preparation is evident even in the meat case. Poultry producers have capitalized on this trend with lightly processed foods, and other value-added products. Microwavability is another trend, as the composition of American households changes. The rise in the proportion of single heads of household and working parents creates a demand for nutritious, simple-to-prepare products.

Today Americans eat 43 percent of the beef they consume away from home. Californians eat out more often than the rest of the United States. We tend to take on the eating styles of the ethnic groups that live here; meat is becoming more of an ingredient in meals due to Asian and Hispanic influences. Californians eat ground beef at home less often than the rest of the United States (California-58 percent; U.S.-73 percent).

With almost 30 million people in California, our preferences may influence the entire industry. The state's population is growing more diverse—in age, in ethnicity, and in type of household. Coupled with a growing concern over health and diet, California's population offers opportunities for target marketing. There are potential markets among income groups, such as catering to the middle-upper income consumer groups' willingness to spend a little more money for variety or novelty in their diet.



McDonald's introduced the McLean Deluxe hamburger in 1991. With 320 calories and 10 grams of fat, it is the centerpiece of McDonald's "Menu for the 90's."

"In today's U.S. business environment, the McLean Deluxe is tangible evidence of our accelerated new product development activity designed to ensure that our menu is responsive to customers' expectations for variety, taste, and nutrition."—Jack Greenberg, McDonald's senior executive vice president and chief financial officer.

- During the 1990s, five of six new residents in California will be Latino or Asian. In 10 years, the Latino, Asian and black population will comprise almost half of the state's population.
  - By 2000, 83 percent of all new entrants into the workforce will be female and non-white.
  - California's median age will increase by two years to 35 by 2000, but will still be four years younger than the national average.
- Source: *UC Focus*, 1991

**Industry Profile:  
Harris Farms, Inc.**

John Harris introduced the Harris Ranch label in 1982, and since then has successfully distributed branded beef on the West Coast, as well as the Pacific Rim.

Profit margins in the beef packing industry are very thin. The Harris Ranch label differentiates his product from the generic product in the meat case. Harris Ranch beef is targeted to today's consumer demanding quality and consistency. It is also the only beef on the West Coast certified under the USDA's Residue Avoidance Program—beef that contains no added hormones, chemicals, or artificial ingredients.

**The California Beef Council** is a marketing order which uses check-off funds for marketing research, promotion and education. An industry advisory board directs its activities. The Beef Council also responds to specific consumer concerns.

***Grades and Standards in Beef Production***

The structure of the beef marketing system, however, is a barrier to these opportunities, since the industry remains essentially oriented toward the product rather than the market. A product orientation focuses on maximizing product flow, thus minimizing processing costs. This also takes place in industries with a market orientation, but market oriented managers pay equal attention to concerns and desires of the consumer; moreover, differentiated products are developed to meet these concerns. The proportion of the various grades of beef change only with the cattle cycle. Continued improvements in processing, transportation and storage technology have outpaced efforts to keep up with changing consumer tastes and desires.

Traditional marbling and fat trim requirements of USDA quality grade "Choice" go against the current tide of health and dietary concern, although they are associated with high palatability. Most fed beef offered for grading complies with the USDA Choice quality grade. While this provides a basis for the wholesale pricing and merchandising of beef, it essentially restricts consumer choice to a product which is greater in fat content than some would want. At the same time, the producer is not given sufficient incentive to produce leaner beef. Since retail outlets buy in volume and their major suppliers rely on USDA quality grades as a basis of purchasing and sales strategies, the individual entrepreneur has had to shoulder the burden of developing and marketing new beef product choices. It is a very difficult market to penetrate.

Responses in the California marketplace include cutting the fat trim from 1/2 inch to 1/4 inch and in some cases to 1/8 inch, with some retailers offering no fat trim at a premium price. Meanwhile, the market pays a premium for "choice," so there is little incentive to produce leaner beef. However, the use of select grade and its increasing availability in retail stores suggest the industry is addressing this demand. There are biological constraints to reducing the fat content other than taking off the trim.

**Challenge to the Beef Cattle Industry: Food Safety**

Concern about meat product safety does not yet approach the kind of "pesticide anxiety" that consumers show over fruits and vegetables. Given the public's heightened awareness of food safety issues, however, there is potential for this issue to affect demand for beef.

The beef industry is regulated to assure food safety. At the processing plant, inspectors from the Food Safety and Inspection Service of the USDA closely monitor animals for disease before slaughter, and then conduct random sampling of carcasses for harmful residues. Most violations which have occurred are due to contamination from antibiotics, usually resulting from inadequate time between treatment and slaughter in cull dairy cows and recently born (bob) veal calves. Several beef producers have developed a USDA verified production control product, which requires their own monitoring for residues in the product beyond that done by the government. Only a small portion of beef receives this label, largely because the rate of contamination in the general supply is so low; little economic benefit results from the practice.

The national beef industry has been establishing additional quality certification programs in response to the high degree of public concern about food safety. These are voluntary and implemented cooperatively by producers, feed yards and government agencies. They include:

(1) An animal health component which educates producers about FDA approved animal health products and their use in prevention and treatment of animal diseases;

(2) A feed production component requiring that all feed ingredients and feed sources be monitored for possible chemical contaminants, and that feed mixing and manufacturing practices prevent animal drug cross contamination.

The California beef industry will adopt such a quality certification program in 1991. Until now there has been no apparent cost in not doing so. However, given the public concern about food safety, the program serves as a model for a suggested code of practice, whether regulated or not. The costs of complying with the program to the beef industry in the state are unknown, but presumably much less than the negative impact of a potential food scare and avoidance of beef if illegal residues were discovered in the food supply. Also, since the beef supply is provided by a national industry, it is imperative for every state to adopt a similar program.

The public's insistence on a risk free food supply is a continuing challenge. It is impossible to scientifically prove food "safe." This does not preclude efforts to regulate or ban certain implants, antibiotics or feed additives. Presently, there are few market incentives for providing "organic" beef; but we expect this market, though limited, to expand.

California beef is raised in a natural environment; cows and calves graze on rangelands. Some producers could use this as a marketing promotion by eliminating the use of hormone implants. However, currently the industry lacks the technology to differentiate natural occurring hormones from supplemental—the levels are low in either case.

Segments of the beef industry also could consider discontinuing use of subtherapeutic antibiotics. This would mean foregoing the benefits of the product and possibly sales of cow liver (due to increased chance of liver abscess), but it would enable them to target a specialized market. If the entire cattle industry did this it might provide some competitive advantage over poultry and pork.

The California Cattlemen's Association (CCA) is developing a **Beef Quality Certification Program**. It is CCA's goal to design a program that is reasonable, enforceable, and that really contributes to increased food safety. This program is supported by producers without funding from the beef check-off program.

## Challenge to the Beef Cattle Industry: Animal Welfare

There is much confusion between animal "welfare" and "rights". Welfare is the humane care of animals; rights are given by law. The movement includes both, but is often characterized as animal "rights". In the United States, more attention is given to pets and research animals, whereas in Europe emphasis is on livestock and poultry, including practices that might affect product quality and safety.

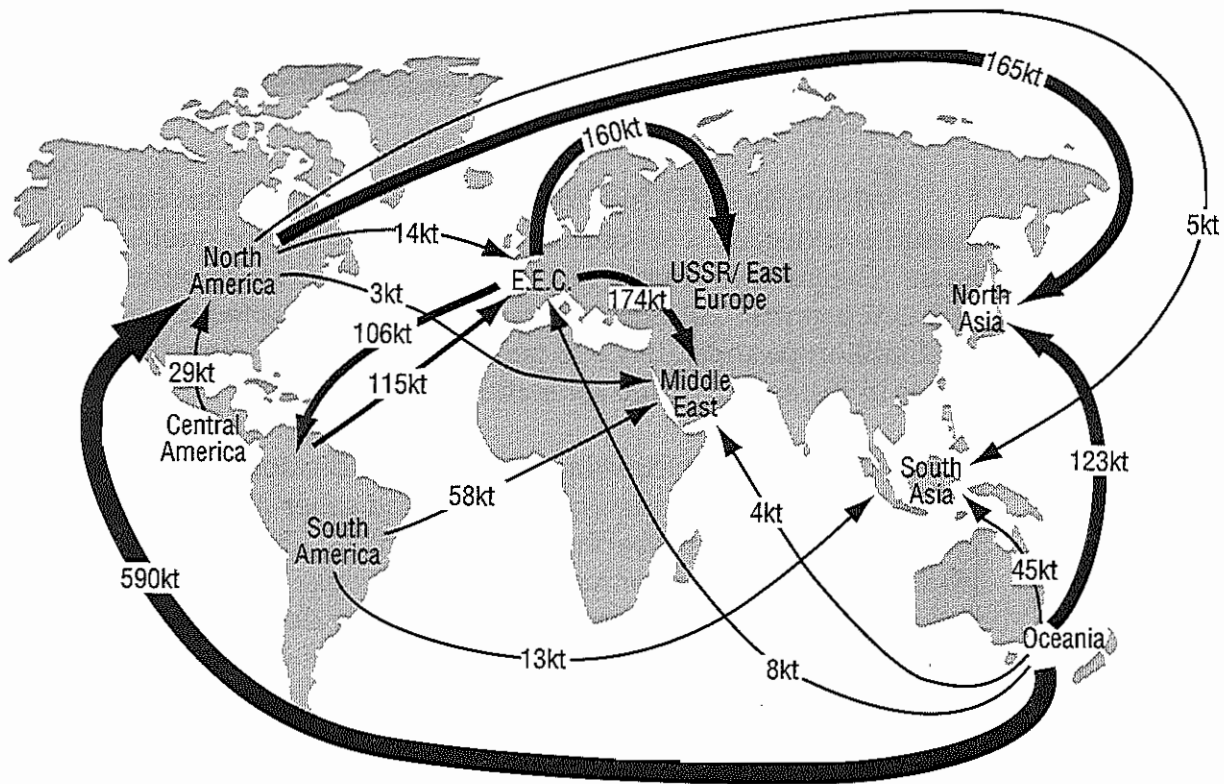
The animal welfare and rights issues are difficult to resolve because they involve ethics and emotion rather than scientific and economic principles. Interestingly, cows (both beef and dairy) are perceived by a larger proportion of the public as being humanely treated than any other livestock. But certain practices are under attack, particularly veal production. Recently the San Francisco-based Humane Farming Association announced a television advertising campaign to show the "evils" of veal calf husbandry. In addition, animal welfare issues concerning the beef industry include castration or dehorning without anesthesia, hot-iron branding and transportation stress.

Some of these objections can be easily accommodated, but others cannot. Dehorning is done for the animal's benefit, to either prevent injuries due to horns of other cattle, or broken horns. Using anesthesia for dehorning may create more stress in the animal than the procedure without it. Castration is required for a beef steer to be marketable, and the procedure should be done early in life. Anesthesia is not required, and the risks of using anesthesia (allergic reaction, death) may outweigh the benefits.

Producers are taking action to adopt industry standards for animal care. The cattle industry and the University of California have begun a project to establish a recommended set of animal care guidelines. Committees for each species have developed a suggested set of practices, and these will be published in 1991 and 1992.

## Challenge to the Beef Cattle Industry: World Trade

World production, consumption, and trade in beef are concentrated in the developed nations—the United States and Canada, the EEC, the U.S.S.R. and Eastern Europe, New Zealand, and Australia. Japanese consumption is growing rapidly but is still comparatively low. World trade has increased more rapidly than production but still accounts for only a small proportion of total supply (Figure 8). International beef markets are sharply seg-



**Figure 8. Major world trade flows for beef and veal.**

Note: All flows calculated as the average of 1986 to 1988 data and specified in shipped weight terms.  
Source: Terry Sheales, Australian Bureau of Agricultural and Resource Economics.

mented because of government policies, including sanitary and commercial restrictions. As a result, price structures differ greatly among countries.

Sanitary restrictions are imposed by some importers on fresh beef from countries in which foot and mouth disease (FMD) is endemic. FMD can be transmitted through fresh meat and can threaten herds in importing countries. Market segmentation results, with the world separated into FMD-free and FMD-endemic zones. The FMD-free zone includes the US, Canada, Japan, Australia, New Zealand, Mexico, Central America, other East Asian countries, and parts of Western Europe and southern Africa. The FMD-endemic zone includes parts of South America (especially Brazil and Venezuela), parts of Africa, the Middle and Near East, the U.S.S.R., and parts of Western Europe and Eastern Europe. FMD-free countries can export beef anywhere, but FMD-endemic countries export mainly to lower-priced markets, which makes beef production and export less profitable in those places. FMD-endemic countries can purchase beef more cheaply because they can buy from any country.

The EEC recently began exporting significant amounts of beef, and at a subsidized price. This has affected the competitiveness of U.S. beef in parts of the U.S.S.R., Eastern Europe, Middle East and Africa where EEC beef is marketed. South American beef

#### Industry Profile:

##### Mount Shasta Beef Inc.

Since the early 1980s when Gene Davis first visited Japan and saw the market potential, the Mount Shasta Beef Company has been developing an operation designed to cater to the Asian market.

Cattle start in the feedlot at 750-850 pounds and are fed for 120 days. Then they are sorted and the cattle most fit for export are fed an additional 120-160 days, and sometimes as long as 300 days. After slaughter, they are shipped in one of three forms, chilled boxed, carcass, and some live cattle.

Since the Japanese distribution and marketing system is very complex, Davis works with a Japanese contact. Mt. Shasta Beef Inc. is moving toward a labeled product.

The U.S. Meat Export Federation says American beef is selling in Japan for three or four times (depending on the cut) the price in the U.S.—a promising market niche.

is most affected since it exports FMD-endemic product, but cannot compete with EEC subsidies.

Within the FMD-free zone, U.S. exports of beef have increased to a degree. Part of this is due to relaxation of quotas in Japan. The Japanese market now accounts for about 75 percent of total U.S. exports. All U.S. 1990 beef exports amounted to about 1,067 million pounds, up 12-15 percent from 1989. Relaxation of quotas in Korea accounted for some of this increase.

Some interpret these increases as an indicator of the tremendous potential for U.S. imports to Japan and other Asian countries. Such a conclusion is probably overly optimistic. Beef is still a relatively new product for most Japanese people; in general, Japanese eat beef only occasionally, and when they do they prefer a highly marbled product (Wagyu). Japanese beef is priced according to quality standards, with Wagyu beef selling for around \$100 a pound at the retail level. The most popular domestic beef is the second grade (Japanese dairy beef) which corresponds to U.S. Prime or high Choice grade. Imported beef consists mainly of frozen U.S. grain-fed beef and chilled Australian grass-fed beef. Japanese prefer chilled beef to frozen, and are willing to pay a premium for beef that is fed high-energy diets for longer periods. Wagyu steers are fed for as long as 20 months, compared to only four to five months for U.S. cattle. Technology exists to produce this type of product, but will take time to develop in the U.S.

Gains made by U.S. beef exporters in Japanese markets during the 1980s appear to be the result of political pressure from the U.S. government, and not a result of rising demand from Japanese consumers for U.S. beef. Indeed, most of the increases in market share came at the expense of the Australian range-fed beef. The Japanese replaced import quotas with tariffs in April, 1991. Nevertheless, the U.S. will probably not substantially increase beef exports to Japan because of the low substitutability of U.S. beef with high quality Japanese or Wagyu beef. There are limited opportunities, however, to penetrate the high-value market niche in Japan because of the comparative advantage of feeding cattle in the U.S.

Other export markets offer limited opportunities. A U.S.-Mexico free trade agreement will probably not significantly impact California's beef industry. Mexico's herd is divided into tropical and temperate zones. Herds in the tropical areas have expanded rapidly in recent years but have been unable to match the growth of domestic demand, and Mexico has gradually shifted from being a net exporter to being self-sufficient in beef. Mexico exports to the

U.S. its northern temperate region feeder calves, which fit better into the U.S. cattle system than into the tropical Mexican system. If Mexico requires beef imports, these will almost certainly come from neighboring FMD-free Central American nations.

In general, California beef producers will have only limited opportunities to increase exports except when they are able to target specific markets while managing feeding and packing operations in an increasingly competitive environment.

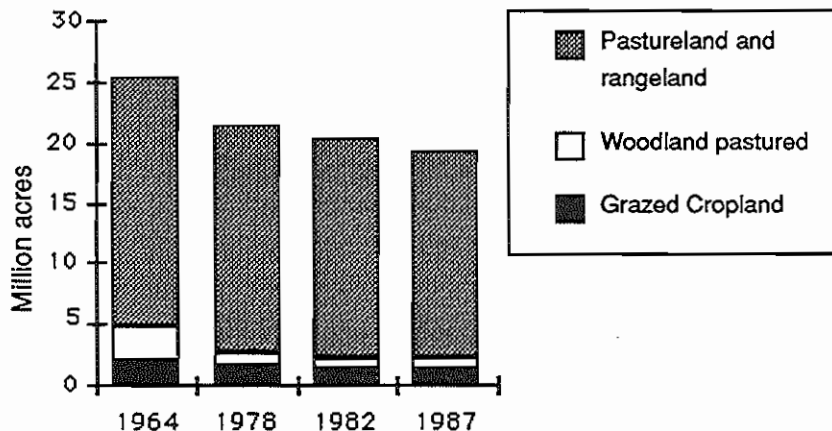
### Challenge to the Beef Cattle Industry: Natural Resources

Environmental and resource problems also confront California's beef industry. Although air quality is an issue, it will only marginally affect the beef industry, primarily where there is a concentration of confined animals. The most important issues involve land and water use. These conflicts are not going to go away, and their influence on the industry is likely to increase.

#### *Land Use Patterns and Implications*

The conversion of rangeland from livestock use to more intensive agriculture or homesites is an increasing challenge. From 1964 to 1987, privately owned dry pasture and rangeland in the state decreased by 5.6 million acres, or 23.2 percent (Figure 9). The average rate of decline has held constant at roughly 1 percent per year.

The urbanization of California has spillover effects on even remote areas of the state as increasing numbers of people seek uncrowded places to recreate or retire. While the rangeland base is still largely intact, its potential as a resource for the beef cattle industry is being eroded.



**Figure 9. California Grazing Land Acreage**

Source: Census of Agriculture, USDA

### Williamson Act Benefits

The Williamson Act program provides reduced property taxes to farm land in return for restricting its development. Participation is voluntary, on the part of both landowners and local governments. Forty eight of California's 58 counties (and 19 cities) offer the program.

On average, nonprime acres (grazing land) receive a tax savings of \$5.60 per acre, which amounts to a 70 percent savings on their tax bill—even considering Proposition 13. Periodically, the effectiveness of the Williamson Act as a land preservation tool is questioned, especially whenever the county or state budget is tight. A recent survey of state and local leaders found 87 percent of all respondents agreed that the benefits outweigh the costs.

Source: *Land in the Balance*, 1989.

The cost of land is a major economic input to cattle production. Rangeland real estate values in most parts of California are higher than livestock-based income alone can justify. In the past, property taxes drove some cattlemen from the business, but the Williamson Act (California Land Conservation Act of 1965) and Proposition 13 mitigated the negative effects of land price inflation on existing operations.

Many of California's rural counties are growing even faster than the state average. Agricultural zoning has not prevented the parcelization of large properties traditionally used for grazing livestock. Small weekend ranches or hobby farms have taken productive cattle lands. Cattle ranches have been surrounded by suburban style housing developments and conflicts have arisen—dogs harassing cows with calves, vandalism to property, complaints from neighbors about flies and dust. Scattered parcelization creates an extensive "edge" effect that impacts livestock production practices and location.

A decline in the practice of controlled burning has taken place since the 1950s, farther reducing grazing land acreage. Air quality regulations and increased costs to private landowners have made prescribed burning less feasible.

Changes in the composition and attitudes of rural populations are also affecting California rangelands (see Table 2). The traditional rural property owner appreciates the natural beauty of the area, but is there primarily because it is a business or family property. New landowners are less likely to rely on natural resources as a source of income. Many are absentee owners with little interest in active land management; they move to the rural areas to enjoy the natural beauty and to escape the city. Old-timers may not understand the overriding concern of new residents with aesthetic and environmental values—particularly since many of the amenities may be on the large landowner's property. Meanwhile, restrictions on development are seen as reducing the value of the land and the landowner's future options (see Table 3).

The beef industry is ambivalent about land preservation because cattle producers often wear two hats—cowboy and landowner. Viable cow/calf and stocker operations require large tracts of land with few people interspersed. The necessary planning tools to maintain this condition are available to local government; what the industry lacks is a consensus or political will for land preservation because it potentially involves forgoing development opportunities.

Respondents Moved to Oak Woodland Seeking:	Percent Owners Under 200 acres	Percent Owners 200-5,000 acres	Percent Owners Over 5,000 acres
Natural beauty	80	70	48
Job opportunities	23	40	25
Escape from the city	80	68	35
Different lifestyle	73	51	30
Recreation	60	60	25
Lower cost of living	33	34	5
Maintain a family business or property	30	75	85

TABLE 2. Attitudes of Oak Woodland Landowners  
Source: Huntsinger and Fortmann, 1990

Respondents Agree that:	Percent Owners Under 200 acres	Percent Owners 200-5,000 acres	Percent Owners Over 5,000 acres
State reg. means loss of liberty & freedom	53	65	79
Regulation leads to socialism	38	50	58
Oaks are being lost in CA.	61	51	21
Oak use should be regulated	35	31	8

TABLE 3. Oak Woodland Landowner Attitudes Toward Regulation  
Source: Huntsinger and Fortmann, 1990

In any case, cattlemen may have fewer choices regarding their land use in the future because urban attitudes and concerns dominate the political agenda in California. Several bond measures have passed in recent years enabling Fish and Game and conservation groups to purchase lands for wildlife habitat and wetlands restoration. Rangelands are under increasing public scrutiny and its owners may find themselves in the same position as owners of timber lands. This is obvious in the debate over leasing public lands for livestock grazing.

### *Public Lands*

Like other western states, California has a large public (federal) land base. While the land area included in federal grazing permits is large, 23 million acres, it contributes only about six percent of the rangeland AUMs in the state. However, these lands provide a source of summer forage that allows cattle movement from the winter annual forage or desert areas. Also, a few beef cattle operations rely on year long grazing permits.

Originally, public land grazing permits (or leases) required the range to have "base" property to accommodate the cattle in the

off season, so most permits were issued to adjacent or nearby ranches. Most of these permits have been transferred along with ownership of the home ranch, becoming part of its "real" value. Desert public land ranchers can use private water sources as the "base" for their permits, which often last the year round. The number and AUM size of grazing permits in California have been shrinking for several decades. This decline has accelerated during the past 15 years as greater public attention has been drawn to the perceived degradation of natural resources and environmental quality; and as pressures for recreational and wilderness uses of public lands have increased. While the loss of permits represents a relatively small amount of the state's forage resource, it places great pressure on individual production units that hold the permit or lease.

### *Resource Management*

Private grazing land acreage, which supports more than 90 percent of livestock AUMs in California, has declined considerably in all parts of the state. This cannot be explained by conversion of grazing land to other agricultural uses. Therefore, it appears likely that this reduction in grazed land is attributable to the development of land for urban and residential uses. However, even as the private land base for beef production has declined, the estimated total number of beef AUMs (both cow-calf and stocker) appears to have increased in the past 25 years.

As a result, it appears we may be approaching or exceeding the grazing capacity of the land in certain locations. Intensity of rangeland use is set more by cattle market and rainfall than by the grazing capacity of California's rangeland. Consequently, rangeland may be overgrazed in some years and undergrazed in others. As development has proceeded, decisions on intensity of use as well as sale of rangeland are affected. The ability of the system to sustain intensities of use beyond 1987 levels appears problematic. Thus, if land conversion has not led to a constriction in beef production in the past, it is increasingly likely to do so in the future.

The California Range Livestock Model (CRLM) was used to determine the effects of converting rangeland to non-agricultural uses. This model projects rangeland livestock numbers and income for eight regions in the state. Using the Forest and Rangelands Resource Assessment Program forecast of 1.976 million acres of rangeland converted to urban uses by 2010, and assuming the state's rangeland productivity would increase by 2.4 percent yearly, productivity changes were calculated for each region. (2.4 percent is the statewide average increase in productivity of rangeland grazed by cow-calf operations, based on Census of Agriculture data

The dominant assumption in the CRLM is a stable cow-calf population and a variable stocker population. This may not hold true for all regions. Other scenarios are imaginable. For instance, in the Central Valley where the uncertainty of available forage impacts management, operators may choose the flexibility of stocker cattle over cow-calf. In the mountain regions, operators may select cow-calf over stocker, especially if feeder operators press to integrate vertically.

from 1978 to 1987.) Using these assumptions, the CRLM predicts a 14 percent decline in stocker cattle and no change in the number of cows and sheep. This translates into a \$4.6 million (4 percent) decline in total range livestock income. These are statewide results. The livestock industry is affected more adversely in those areas where urban development is greater.

Anecdotal evidence suggests that leased land is more intensively grazed than owner-operated land. Documentation of the relationship of land ownership and intensity of use, trends in actual livestock grazing use, and actual grazing impacts on the environment need further study.

### *Water Supply*

Competition for water in California is among the most important issues facing California agriculturalists—and the beef industry cannot escape this challenge. Agriculture uses more than 80 percent of the developed surface water supplies in California. Irrigated pasture and alfalfa production account for a large proportion of this. Traditionally, agriculture has had access to an ample water supply at relatively low rates compared to those for M&I and residential users; but now the allocation and cost of water to agriculture is being challenged by urban customers. California's population will continue to rise, but the supply of water will remain limited, variable and unpredictable from year to year. This will result in short term water shortages which will in turn cause more pressure for water conservation, re-allocation and higher water use fees.

In the long term, competition for water will marginally affect the beef cattle industry, primarily through higher forage costs and increased water rates for irrigating pasture. Irrigated pasture is a source of seasonal forage, but the largest proportion of animals are produced on rangeland. Beef cattle also use alfalfa seasonally, but the larger users of alfalfa are the horse and dairy industries.

### *Water Quality*

Cattle producers must be concerned with water quality management. Rangelands in California are also part of a watershed, with runoff water feeding into one of the many creeks, rivers or reservoirs. Little scientific information is available about rangeland's contribution to the degradation of water in the state. Nevertheless, regulatory agencies are turning their attention towards non-point sources of pollution—and rangeland and other agricultural uses are regarded as non-point sources.

Federal legislation empowered the Environmental Protection Agency (EPA) to regulate water quality through the Clean Water Act of 1977 and 1987. In turn the EPA charged states with the responsibility of developing water quality standards, water quality management plans and implementation programs. California's Porter-Cologne Act had already established the State Water Resources Control Board and its nine Regional Water Quality Control Boards (RWQCBs) as the regulatory agencies for water quality issues. Formerly, the RWQCBs allocated their limited resources to point sources of pollution, particularly municipal and industrial sources and, more recently, storm water drainage. With increasing frequency, however, the RWQCBs are becoming involved in regulatory actions against non-point sources.

In an attempt to establish a proactive program for dealing with water quality impacts of rangeland, the Range Management Advisory Committee requested assistance in proposing a five year program. This is being developed through various agencies and organizations at the state and local levels, including the University of California Cooperative Extension (CE), Soil Conservation Service (SCS), Resource Conservation Districts, and California Department of Forestry. A key component of this proposed program is the identification of issues and development of watershed management plans (a Best Management Practice process) at the local level. The RWQCBs prefer a voluntary program over a full regulatory program and they are working with the Range Management Advisory Committee.

#### Challenge to the Beef Cattle Industry: Regulatory Constraints

Public interest in environmental quality and other values attributed to the vast land area associated with range cattle production are placing more regulatory pressure on land uses involving livestock grazing. Legislation and regulation at all levels—federal, state, and local—are shifting the ability to make these land management decisions away from the landowner to the public arena.

Some major problems associated with these shifts are the perceived loss of private property rights; involvement of numerous governmental agencies, sometimes with conflicting mandates; involvement of special interest groups, also often with conflicting goals; lack of adequate information to make informed judgments; and lack of processes to establish management programs.

California's response to environmental concerns resembles that of the nation, only more so. A proliferation of state regulations

and special programs that relate to wildlife and fisheries habitat, water and air quality, and open space and recreation are restricting management options for range livestock operations. Management decisions now have to include these concerns in addition to the traditional cattle-related factors that influence the economic picture.

Most of the focus within the state thus far has been on chaparral, riparian, and wetland areas; hardwood management; wildlife and fisheries habitat; and rare and endangered species. To encourage participation in programs to address such issues, economic incentives are offered. To take advantage of these incentives, management plans are often required to address specific concerns; in some cases, management plans may be allowed as an indication of compliance with the intent of the regulation.

Many of the environmental concerns (water and air quality, wildlife, fisheries) go beyond the property boundaries and as such may have a "cumulative" impact along with other lands in the area. These situations lead to the need for collective management approaches with other landowners, both public and private. Approaches such as Coordinated Resource Management Planning (CRMP) are providing examples of how this might be done. These more complex approaches to resource management come with additional costs of time, money and stress.

Currently there is an institutional gap within the industry in dealing with many of these issues. The beef industry has several organizations which work for the producer. The California Cattlemen's Association represents their members with a communications network including publications, legislative advocacy, and public education program. The National Cattlemen's Association provides similar benefits to members at a national level. Ranchers are also active in local Resource Conservation Districts with a focus on soil and water conservation. However, there is a widening gap between the efforts by those involved in environmental research and those advocating for the beef industry. The only formal efforts are either through the state Board of Forestry's Range Management Advisory Committee or the National Cattlemen Association's Environmental Stewardship Award program. The ever expanding environmental agenda, and the complexity of the issues involved are compelling reasons for industry organizations to expand their role in these areas.

#### Industry Profile:

Jan Smith is a cattle rancher in Madera County. The Five S Ranches, Inc. is a "one iron" cattle operation, which means they breed their own cattle and raise the calves to about 800 pounds. Smith doesn't use hormone implants, and has found a market for her 400-500 head a year in the Bay Area where they go to the restaurant trade.

As in other industries, Smith witnesses an increasing load of paperwork in the family business. Smith's grandfather didn't fill out any paperwork when he started the operation; her father spent an estimated 20 hours a year filling out forms, and today Smith and her family spend 20-30 hours a month on required documentation.

There are over a hundred Resource Conservation Districts (RCDs) in California. They are part of a national network created during the Dust Bowl days over 50 years ago. Each RCD is governed by local landowners and others who volunteer to assist conservation programs in their community. They receive technical assistance from the USDA's Soil Conservation Service and guidance and support from the California Department of Conservation.

## The Dairy Termination Program's Effect on the Beef Industry

The DTP was designed to subsidize a reduction in milk production from the U.S. dairy herd by 12 billion pounds of milk (the equivalent of about 1 million cows). Dairy-men submitted bids indicating their willingness to liquidate their total dairy herd, and not to reenter the business for a period of five years nor to build any new facilities during the "quarantine" period.

Two provisions developed ostensibly to provide a degree of market protection for beef producers proved inadequate. Cattle prices turned down, and the DTP was a major factor. A comparison of market prices over a 10 week span in 1986 points to the magnitude of the problem. Prices of cows fell from \$39.50 to \$35.00 per hundredweight during the period and reached a low of \$31.50 per hundredweight in early May. After the low period, they recovered slightly, but never ascended to price plateaus of the previous year.

## Challenge to the Beef Cattle Industry: Agricultural Policy

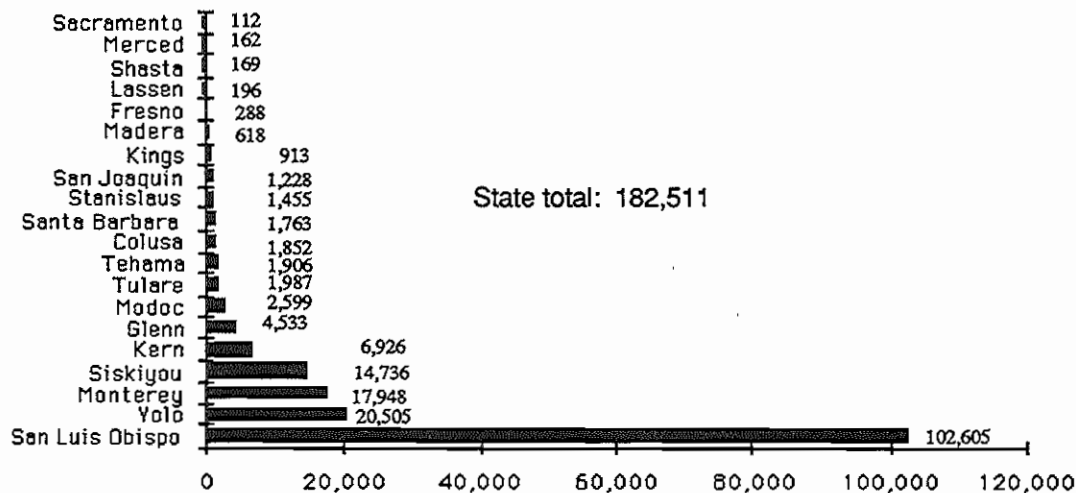
Direct government involvement in the beef industry is limited. There is no formal federal farm price support program for beef producers, although they are indirectly impacted by the effects of other farm programs.

The engine driving meat production in the United States is the government's "cheap grain" policy which furthers the practice of grain-intensive confined feeding operations. As a rule of thumb, the nation's farmers have the capacity to produce more than two times the annual volume of feed grains that can be consumed domestically, and more than five times the volume of wheat that can be used domestically. Since World War II, successive administrations have been unable to devise an effective long term strategy for dealing with this over production problem. Grain stocks have been reduced to extremely low levels from time to time, particularly when prolonged drought has occurred and/or periods of inflation resulted in depletion of surpluses through greater volumes of trade; but the overall pattern has been one of surplus accumulation. Animal production industries with the most efficient grain-to-meat conversion characteristics benefit most from such a policy. The overall growth of the poultry industry attests to that fact.

While cattlemen philosophically oppose government programs, they appreciate the impact of "cheap" feed grains since the short term effect is to increase the demand for feeder cattle. In the longer term, low priced feed grains drive the feedlot demand for feeder cattle; cattlemen retain more breeding stock in anticipation of higher prices; the herd buildup continues until some exogenous shock triggers a liquidation and the process repeats itself.

The 1990 farm bill will, in all likelihood, maintain the status quo in this regard. Land conservation portions of the bill which allow set aside acres to be used for livestock production are likely to stimulate some demand for beef cattle. However, present feed grain stock levels are sufficiently low to cause market volatility in the event of inclement weather or natural disaster. This part of the equation remains consistent with the past economic environment.

The Conservation Reserve Program (CRP) is another farm bill provision affecting the beef industry. It is intended to assist owners and operators of highly erodible cropland to conserve soil and water resources on their land and ranches. About 170,000 acres are currently enrolled in California, the majority of which is in San Luis Obispo County (see Figure 10). CRP contract holders receive



**Figure 10. Conservation Reserve Program in California:  
County by county summary of enrolled acreage**

Source: USDA, Soil Conservation Service

about \$49 an acre per year in exchange for establishing a permanent vegetative cover on the land. While the payments do improve the cash flow of some California landowners, they also remove rangeland from livestock production, since contracted acreage may not be grazed or harvested.

### Challenge to the Beef Cattle Industry: Integrated Management

With greater consumer segmentation in California and more accessible Pacific Rim markets, management options for California producers will increase. Markets for California cattlemen could include both high and lower quality outlets in the U.S., plus exports. When these increased marketing potentials are considered with the varied environmental conditions in which cattle are raised in this state, many potential management combinations appear.

Traditionally, management has included animal health, production and economic decisions but not those related to natural resources. However, the successful operator is probably already integrating natural resource management into his or her decision-making process; and what some ranchers are doing intuitively needs to become more a widespread practice in the industry.

The beef industry has overcome past challenges, such as matching the type of livestock to the environment, selecting breeds, protecting animal health, and managing forage. Tackling any one of these issues is no longer sufficient in itself. Integrated manage-

ment as a systems approach holds the most promise for long term success in the beef industry.

#### Industry Profile:

Steve Sinton, a fourth generation rancher, is working with the University of California on non-chemical means of controlling yellow starthistle, using two natural predators: stem weevil and seed weevil. He hopes for weed control alternatives that avoid the regulatory problems surrounding herbicide use.

A time consuming requirement for Sinton is the new worker safety program (SB 198, effective in July, 1991). All employers, including ranchers, must prepare a safety plan, but the state has provided little or no guidance on what is required.

#### Labor

Since California's labor rates tend to be higher than the national average, California ranch operators must compete in a more costly labor environment, a market driven by, among other things, employees' need for packages of benefits which at least partially offset rising health and retirement costs. The quality of labor is directly affected by a manager's ability to offer some of these programs. The increased costs must be recaptured in the form of higher productivity or smaller profit margins will result. Under these competitive pressures, livestock managers need to tap two distinctly different labor pools: the relatively unskilled who will work at non-competitive rates, and the relatively skilled who require competitive wages and benefit packages. In either case, the continuing evolution of the California labor market will place a premium on superior management skills.

#### Financial and Risk Management

Financial institutions presently require detailed management plans as a prerequisite to loans. The American Bankers' Association is pressing for a uniform set of such requirements throughout agriculture. While these standards may not be imposed immediately, financial planning and risk management will become part of the individual manager's tool kit. The experience of the 1982-86 agricultural depression suggests that operators who do not possess or who are unwilling to acquire those skills will not be able to survive in the present dynamic markets.

At the same time, there are problems in adapting particular risk management tools for California beef producers. Beef prices and the futures market are set in the Midwest where the vast majority of finished cattle are produced and fed. California beef is marketed in the off-season and therefore is less able to offset risk with cattle futures. Also, stocker operators graze animals in California later in the year than Southwestern producers because of late spring forage, but the futures market is based on the Southwest—effectively preventing California ranchers from using futures as a pricing basis in late May, June and July.

Lending institutions' reluctance to provide capital without sound financial planning suggests risk management will become more widely used in the future. The form of that risk management is unclear, but a more highly sophisticated level of management than that now generally prevailing in the industry will likely emerge.

### *Animal Nutrition*

There are nutritional concerns at both the micro and macro level. A rancher needs to match his cattle's nutritional needs to the available feedstuffs. For some, the critical resource of summer grazing lands are carefully coordinated with smaller acreages of wintering-lands. Other areas depend on a highly variable winter range. Flexible management and ready access to local transportation are critical. At the macro level, cattle are moved throughout the state and into neighboring states, requiring competitively priced livestock transportation.

Since feed is typically the largest single cost for beef production, significant advantages are provided with by-product feeding. California agriculture leads in quantity and variety of crops, which gives the California beef industry many opportunities to utilize crop by-products in order to lower feed costs in feedlots and provide range supplements.

This alternative is limited not only by the amount of crop by-product available but also by nutritional factors. In many cases part of the original product is removed, so the by-products are typically of low quality or missing in some nutritional component. This varies among commodities. However, increasing knowledge of ruminant nutrition suggests that cost-effective supplements could be created. Adding minimal amounts of high cost supplements to low cost by-products would still result in a low cost feed source, permitting use of larger quantities of by-products.

Currently, crop by-products include significant amounts of carbohydrate that is chemically bound so that even ruminants have trouble digesting it. Research is being conducted to develop specific microbes or enzymes through biotechnology to "process" these carbohydrate structures into forms usable by ruminants. As these products are developed, significantly larger amounts of crop by-product carbohydrates not currently biologically available will be usable.

Historically, searches for improved forages have played a large role in range research and extension programs. Recent work at opposite ends of the state demonstrates the opportunities for development of region-specific forage varieties—a clover adapted to desert-like conditions of Southern California; a rangeland clover adapted to freezing temperatures of mountainous Northern California; and warm season grasses adapted for the milder Central Valley climate.

California's Mediterranean climate also provides major obstacles to forage production due to favorable growing conditions for weeds, resulting in widespread varieties of noxious weeds. For example, yellow starthistle (*Centaurea solstitialis* L., Asteraceae) occupies nearly 8 million acres, and is a serious economic constraint on rangeland.

### *Integrated Research*

University organization reinforces specialization, but effective research on integrated management requires interdisciplinary collaboration. University of California faculty are conducting research in animal science, range science and agronomy, agricultural economics, veterinary medicine and other disciplines. In addition, Cooperative Extension personnel provide educational assistance to beef producers and conduct applied research on campus and at the county level. Yet, in spite of on going activity, these efforts often are not integrated in ways that encourage systemic or holistic approaches.

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## For Further Reading

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## Study Group Members

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### James Cothorn, Study Group Chairman

Cothorn teaches agricultural economics at CSU-Fresno. He also does applied research in finance, agricultural marketing at the Center for Agricultural Business an affiliate of the California Agricultural Technology Institute.

### W. James Clawson

As an Cooperative Extension range specialist in the agronomy and range science department, UC Davis, Clawson is concerned with resource issues. He is actively involved in designing the proposed water quality program for rangelands.

### Dan Drake

In addition to working with beef cattle producers as a C.E. farm advisor in Siskiyou County, Drake does applied research in computer modeling for rangeland resources.

### Gregory Greenwood

Greenwood in involved in the FRRAP program as well as other resource related projects in the Department of Forestry and Fire Protection. He is also actively involved in designing the proposed water quality program for rangelands.

### Gerald Horner

After working as an agricultural economist with expertise in irrigated agriculture for the USDA, Horner now consults on a variety of resource issues. He created the California Livestock Model.

### Chris Nelson

As the ranch manager for San Felipe Ranch, Nelson represents the producer's viewpoint in the study group. He has a M.S. in ruminant nutrition from UC Davis.

### James Oltjen

Oltjen is an extension animal management systems specialist in the animal science department at UC Davis. His interests include computer modeling and nutrition issues.

### Julie Spezia

Spezia was the coordinator for the UC Agricultural Issues Center's Williamson Act Study. She also served as analyst on the study of California's Central Valley.



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