Beef's Challenges for 2005

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Introduction

U.S. cattlemen are on the brink of what some view as a period of unprecedented opportunities. The North American Free Trade Agreement (NAFTA) was enacted less than 18 months ago to join Mexico, the U.S., and Canada into the world's largest free-trade zone. The Global Agreement on Tariffs and Trades (GATT), whose possible ratification is scheduled to be debated this year, will further expand international beef trade possibilities. Together, these agreements signal the emergence of increasingly global markets for beef and other agricultural products that may, in turn, represent exceptional market opportunities for U.S. producers. Some cattlemen also see changes in domestic farm programs, including the "repatriation" of lands placed in the Conservation Reserve Program (CRP), as steps that will reduce their costs and improve their competitive position relative to other U.S. meats and foreign competitors.

Unfortunately, it seems that many U.S. producers have come to view these developments as a *"quick-fix"* remedy for the losses of market share they have sustained in U.S. meat consumption. However, as a practical matter, it is doubtful that international markets will easily or quickly offset the losses of domestic meat market share that have occurred over the last 20 years. It is also doubtful that cattlemen will receive the economic benefits they anticipate from restructuring domestic farm programs.

The historic decline in domestic market shares suggests fundamental weakness in the traditional U.S. beef production and marketing systems. Furthermore, traditional answers are unlikely to work any better in the future—in either domestic or international markets.

Changes in virtually all phases and aspects of beef production and marketing will likely be required for U.S. producers to regain domestic market share while preparing to capitalize on the opportunities of an increasingly global beef market. In this paper, we focus on the nature of those changes. To accomplish this, we first attempt to bring the future into focus through a historical perspective. We then examine the implications for U.S. beef producers of emerging domestic and international market changes. Finally, we discuss some of the specific challenges and opportunities these changes suggest for U.S. beef producers in the next decade.

The U.S. Beef Industry: A (Recent) Historical Perspective

Discussions of the U.S. beef industry's current condition inevitably focus on changes in domestic market share. However, it is not clear what is meant by market share or what factors may have contributed to any changes in beef's market share over time. Both of these issues require clarification if we are to appreciate what the future may hold for U.S. beef producers.

Beef's market share can be measured in either of two ways: (1) as a percent of the weight of meat purchased or (2) as a percent of consumer expenditures on meat. The two have markedly different implications for the beef industry.

Since 1976, the per capita weight of beef consumed in the U.S. has declined. Pork has remained essentially constant, but poultry and fish consumption has increased. In combination, these changes have caused beef's share of per capita (retail) meat consumption to fall (Figure 1). If trends

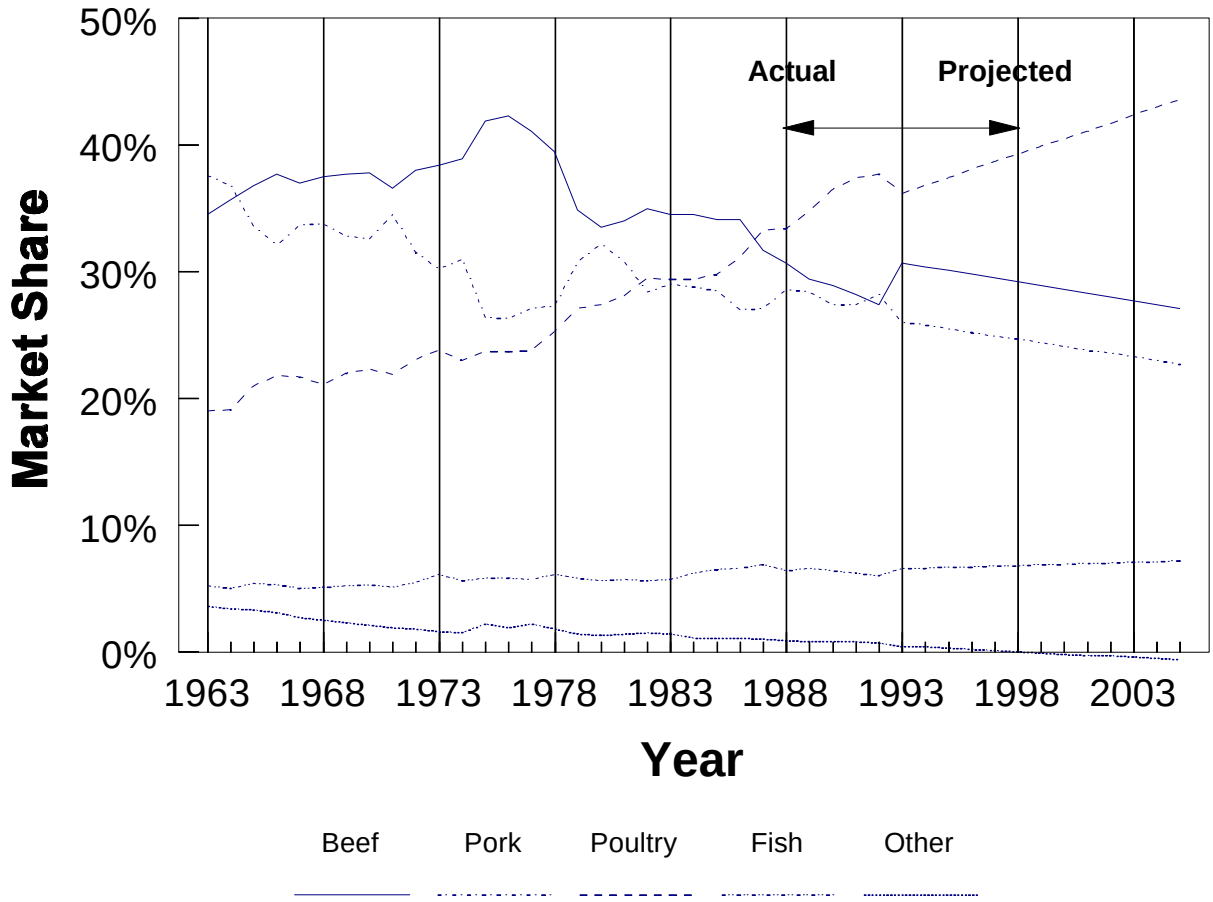

Figure 1. Retail meat market shares over time.

over the last 30 years (1963–1992) persist, beef could represent only about 25 percent of meat consumption by 2005, while poultry could exceed 40 percent.

On its surface, such market erosion is certainly cause for concern. It is clear that consumers have substituted other foods for beef and pork in their diet, thereby reducing their intake of red meats. However, it not clear why such substitutions have occurred.

We could speculate that health concerns regarding "red meat" consumption have fostered these changes in consumer tastes and preferences. However, more tangible reasons may also be involved. Most notable of the alternatives potentially contributing to changes in beef's share of meat consumption are changes in beef's price relative to other meats.

Over the period in question, retail meat prices have also tended to vary. However, after adjusting or inflation, all meat prices have tended to decline ver the last 30 years—with poultry (chicken) prices declining proportionately more than either beef or pork (Figure 2). For example, in 1963 the average retail chicken price was $1.12 per pound (in 1980 dollars). By 1994 retail chicken prices had fallen by

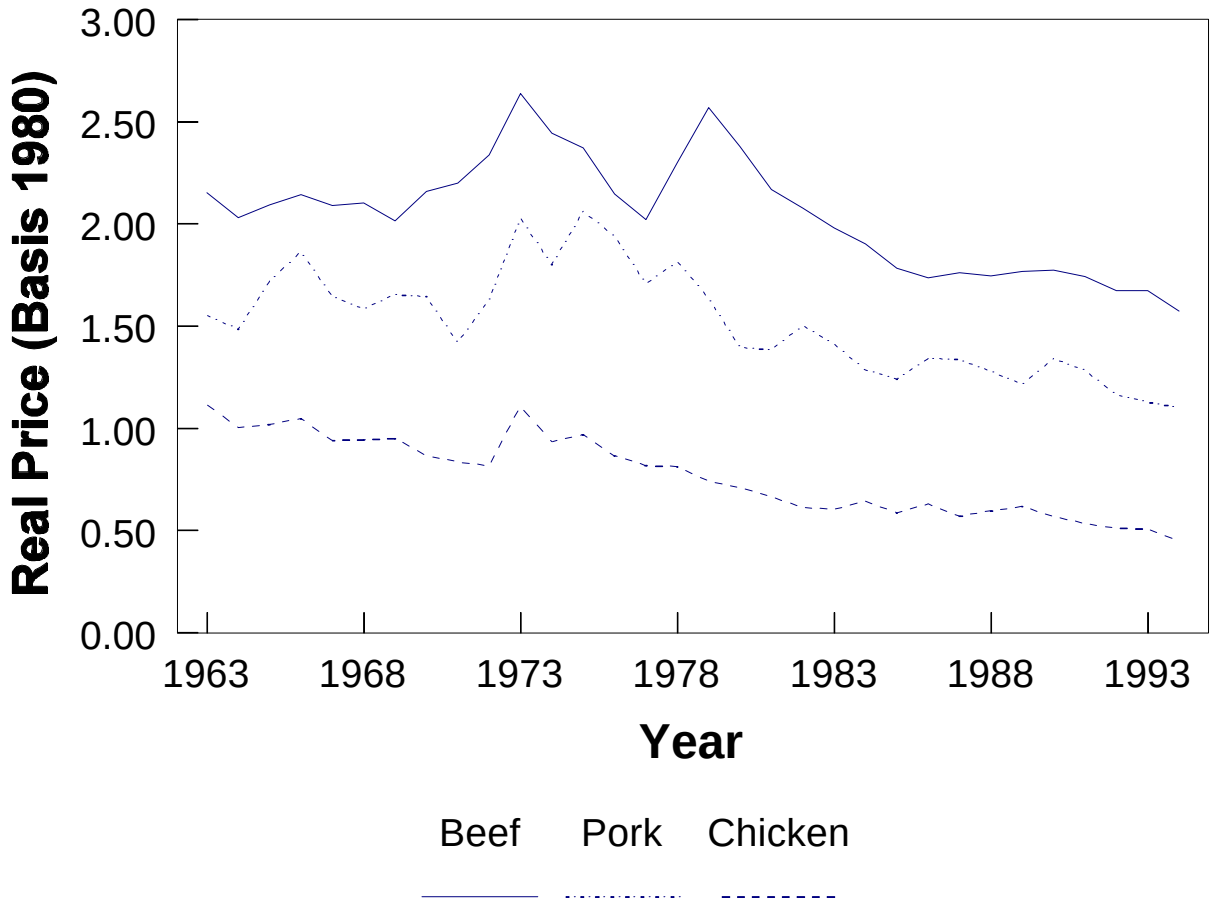

Figure 2. Real (basis 1980) meat prices.

percent, to about $.45 per pound (in 1980 dollars). ver the same period, retail beef prices only declined 7 percent, from $2.15 to $1.57 per pound in 1980 ollars. Hence, the ratio of beef to chicken price early doubled, from 1.92 in 1963 to 3.49 in 1994; and in only 30 years, beef has became nearly twice as expensive, in relative terms, as chicken.[1]

It seems likely that such dramatic changes in relative prices, especially between beef and chicken, might affect consumption. Consumers would be inclined to shift away from the more expensive meat in favor of the one with a relatively lower price. Hence, they would increase their consumption of poultry and reduce their consumption of beef based only on relative price changes. Furthermore, if meat prices have increased relative to non-meat food prices or the prices of non-food items, the shifts might be even more dramatic because consumers might also have substituted vegetable products for meat in their diet and increased their consumption of other items relative to food. This finding is

[1]At the same time, the beef/pork real price ratio increased from 1.39 to 1.42 and the pork/chicken real price ratio increased from 1.38 to 2.44.

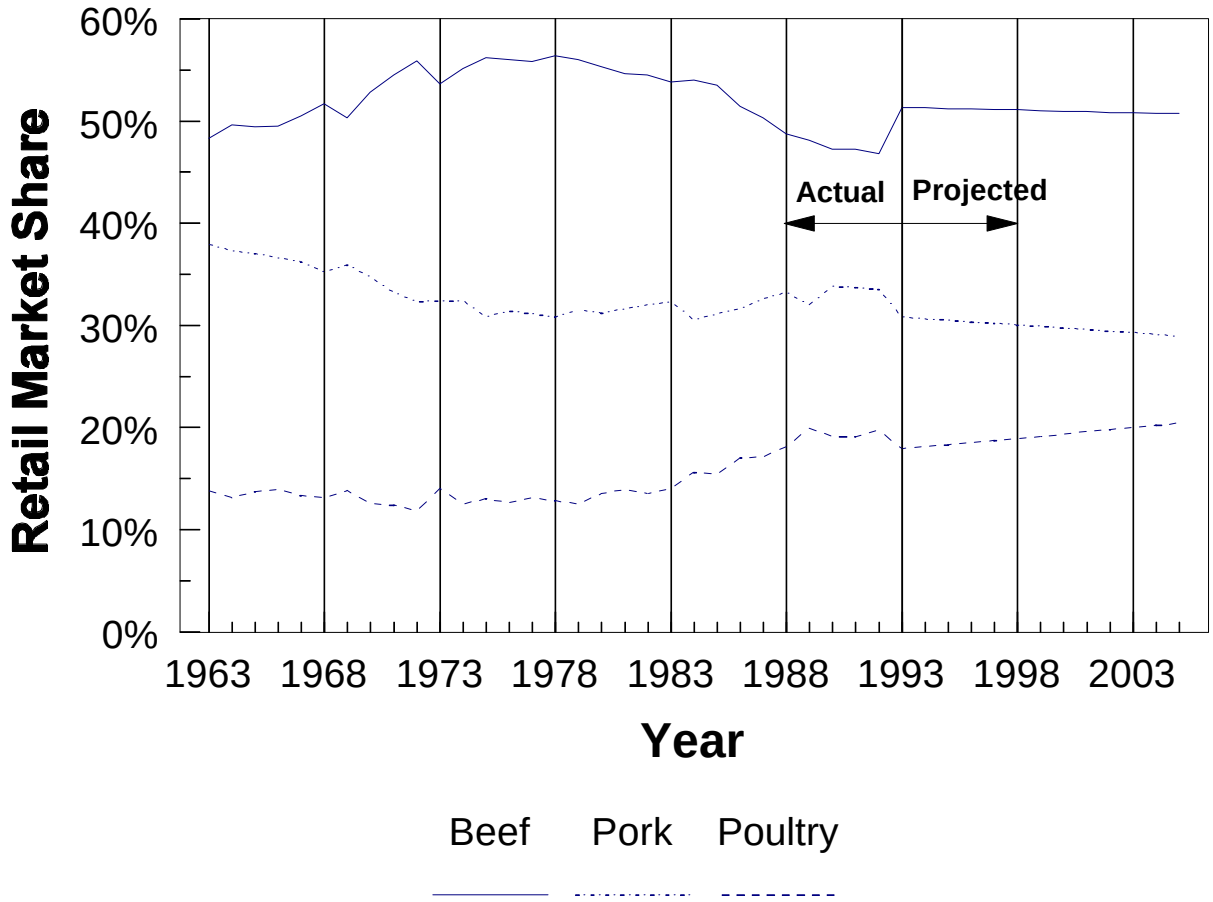

Figure 3. Retail meat expenditure shares (basis 1980).

supported by recent research indicating that 90 percent of the historic variance in U.S. beef consumption can be explained by changes in price (assuming constant
tastes and preferences) in a full expenditure model of aggregate consumption (Melton and Huffman).

Changes in prices largely explain the observed changes in beef's share of meat consumption. However, total expenditures on beef are equal to its price times the quantity purchased. If one increases while the other falls, the net effect on total expenditures is uncertain.

Figure 3 shows the expenditure shares for beef, pork, and poultry (based on chicken price) adjusted for inflation (basis = 1980) over the past 30 years. Beef has been remarkably stable over this period, with about a 50 percent market share.

Only since 1988 has beef's share of consumer meat expenditures fallen below 50 percent, whereas pork's share has declined and poultry's share has increased for most of the last 30 years. It is unclear whether the most recent declines in beef expenditure share (since the mid-1980s) constitute a new trend toward less beef expenditures or a simple variation. It appears, however, that a stable real beef price in the

face of continued declines in pork and poultry prices (Figure 2) may explain the decline in beef's share of consumer expenditures. It is also clear that the erosion of beef's share of meat consumption does not carry over to expenditures. That is, the higher price of beef leads to less consumption, but consumers still spend the same or more on this smaller quantity because of its higher price. As a result, beef's market share, at least in terms of consumer expenditures on meat, appears to be quite stable.

These results are not intended to imply that the beef industry need not concern itself with market share. Instead, they are intended to introduce a certain realism and balance to the debate. They are also intended to remind beef producers that if their primary concern is increasing the quantity of beef consumed (share of meat consumption), they need only reduce beef prices. On the other hand, if beef producers are motivated to increase their revenue (share of consumer expenditures), and eventually their profit, the past 30 years have not seen the erosion of market share that would be suggested by the prevailing level of industry consternation.

Although selling the largest quantity may appeal to the ego, for the balance of this paper we assume that beef producers would prefer more tangible economic rewards. Hence, we restrict any further

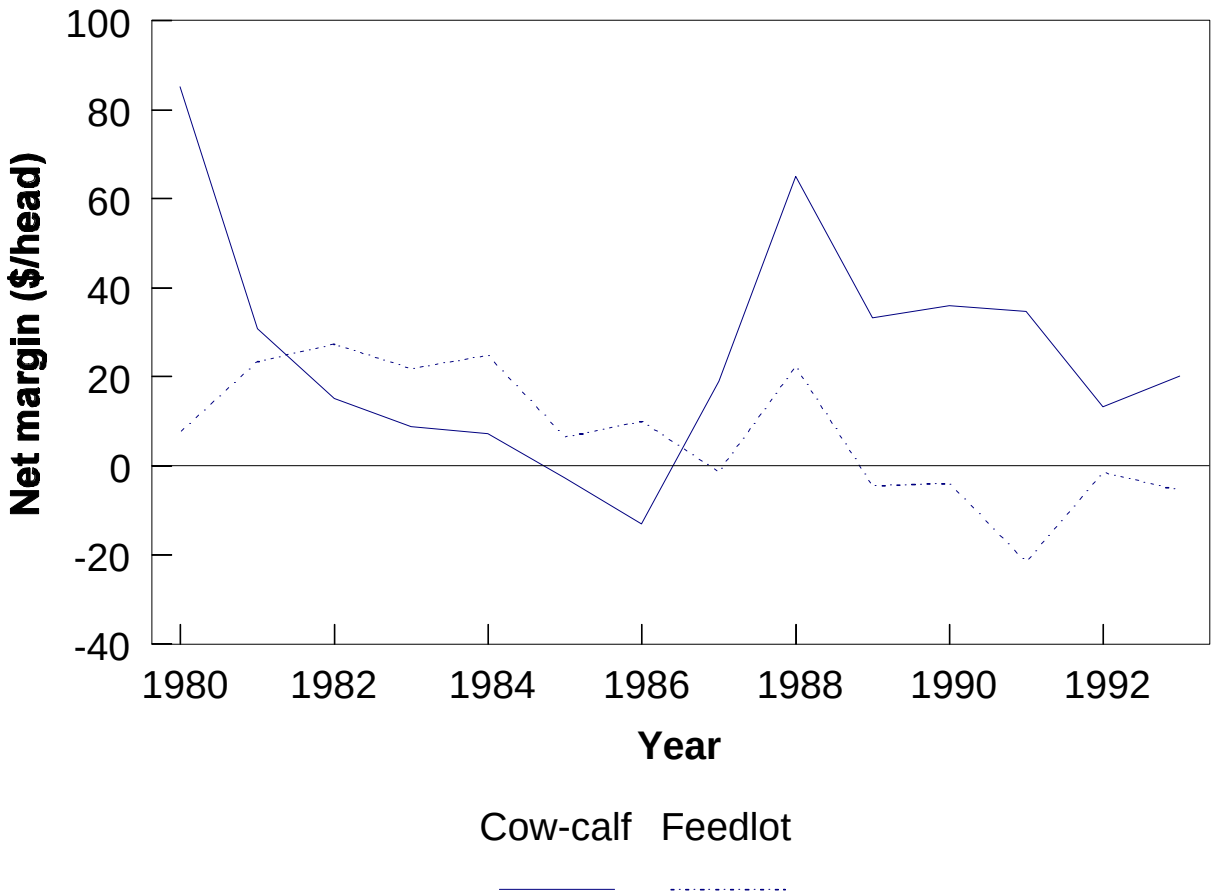

Figure 4. Real (basis 1980) net margins.

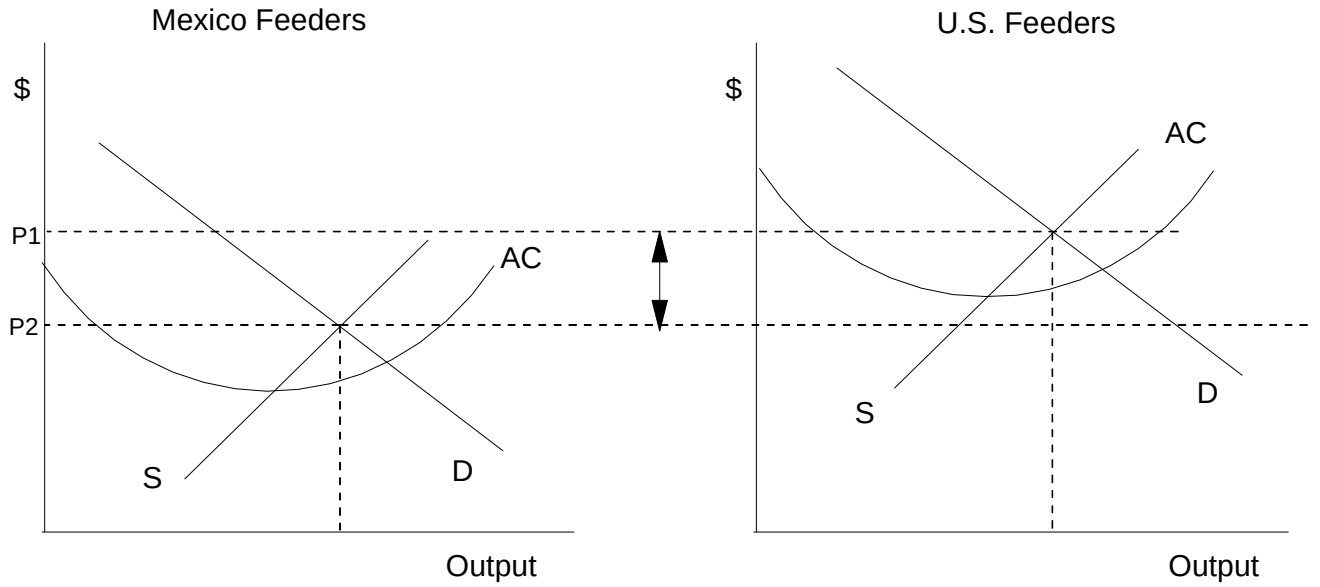

Figure 5. Comparative advantage in feeder markets.

discussions of beef market share to mean the share of consumer expenditures on beef.

Although the share of expenditures on beef has intuitive appeal, the real crux of the matter for most producers is not sales (expenditures), but profit. In general, the gross marketing margins for farm and slaughter beef have fallen in recent years. Hence, producers, either at the cow-calf level or the feedlot, have tended to have less gross income to work with each year. However, by itself, a declining real margin does not necessarily indicate declining profits. If costs are declining faster than revenues, then profits may actually rise (despite falling revenues).

To examine this possibility, we define the cow-calf margin as the sale price of a 700-pound feeder and the feedlot margin as the difference between the purchase price of a 700-pound feeder and the sale price of a 1200-pound slaughter animal. We further estimate costs in terms of real input prices to approximate the real net margin under constant technology for both a cow-calf producer and a feedlot operator (Figure 4).

These results highlight the true nature of the problem facing beef producers. Profits for beef producers have been quite variable in recent years, while continuing a generally downward trend. That is, profits have fallen over time even though beef prices, at least at a retail level, have not fallen as severely as for pork or poultry. The real problem for beef producers is how to improve their profits in the future—not their market share.

Challenges and Opportunities: Viewing the Future Through a (Cracked?) Crystal Ball

Profit depends on two interrelated components: higher revenue and/or lower cost. The former is typically associated with market changes, and the latter with changes in either input prices or technology. Possibilities exist in both areas for producers that are willing to meet the challenge, as discussed in the following sections; but the changes required to capitalize on these opportunities will be neither easy nor traditional for most cattlemen.

Emerging Markets and Market Changes Beef markets are changing, both domestically and internationally. These changes present opportunities for U.S. cattlemen, but also present additional challenges with which many may be unprepared to cope.

International Markets. Many cattlemen tend to think of changing markets in terms of export possibilities that may improve their sales and increase their revenue. They see NAFTA as a means of expanding their market, and GATT as the next step to U.S. domination of world beef markets in much the same manner as the U.S. dominates international grain markets (such as for corn).

However, such a view may be extremely short-sighted. For instance, trade agreements are bilateral by their very nature. Hence, if markets in other countries are opened to U.S. beef exports, the U.S. must also open its markets to potential beef imports, and the U.S. has historically been a net beef importer.

Recent research indicates that NAFTA will over time (within the range of transfer costs between the countries) in the absence of any trade barriers (e.g., see Figure 5).

Because of its lower input cost and greater relative resource base—especially in forage—Mexico has a comparative advantage in feeder calf production. That is, Mexico's average cost (AC) is lower, and its producers can accept a lower price (P2) for domestic production than can U.S. producers. However, the higher U.S. price (P1) is an incentive to export and thereby gain a higher price. For that reason, Mexico has historically exported feeder cattle to the U.S., and those shipments would be expected to increase when trade barriers are removed, as under NAFTA. As imports increase, U.S. supply will increase and price will fall. The higher U.S. cost (AC) will allow limited adjustments, and profits will fall or become negative for some U.S. producers who will be forced out of business.

Mexico also has low labor cost (wage rates) relative to the U.S. that give it a comparative advantage in food and food product processing. This advantage already contributes to Mexico importing beef hides to support its leather industry. With appropriate technology and infrastructure, Mexico could also easily develop a cattle feeding and packing industry similar to that in the U.S., but relying on imported grain. Under these conditions the demands on Mexico's forage by calves would fall, allowing the cow herd to expand. At the same time, Mexico would have excess beef (relative to the domestic demand) that could be exported to the U.S.—causing beef prices to equalize between the two countries by reducing U.S. prices.

In short, equalization of prices between countries drives trade. So long as the U.S. has relatively high beef prices, it will be under pressure from foreign imports. GATT and other movements to remove trade barriers may further expand the competitive pressures on U.S. producers as even more countries attempt to increase their beef shipments to the U.S.

This is not to imply that U.S. producers will not probably result in increased imports of feeder cattle from Mexico that will reduce prices to U.S. cow-calf producers (Melton and Huffman). This result is unsurprising in light of the approximately one million head of feeder cattle per year that the U.S. has historically imported from Mexico. However, this research suggests that, in time, Mexico may dramatically expand its cow herd and become a net beef exporter to the U.S.

Mexico's income simply does not have the growth potential required to greatly increase its beef imports from the U.S. It does, however, have the resources necessary to increase its production if suitable technology and capital were available (e.g., transferred from the U.S.)

The basis for such a conclusion relies upon the economic concepts of comparative advantage and trade. In short, comparative advantage exists when the costs of production in one area are less than another. That country will be a net importer to the other country without comparative advantage and the price in the two countries will tend to equalize

be able to benefit from expanded international trade. However, U.S. producers can not simply assume that their beef is the world's *best* meat buy, or that any gains in beef trade realized from a global market will always flow in only one direction—to the benefit of U.S. producers. U.S. beef producers will have to compete in international markets with other countries that have lower cost for many types of beef. Their ability to compete in these markets will depend on the market (location and beef type) in question.

Domestic Markets. Because of the relatively high cost of beef production in the U.S., domestic markets would appear to hold much greater short-run potential for U.S. beef producers than international markets. In domestic markets U.S. producers are insulated by international transportation cost and are more attuned to the types of beef demanded.

However, domestic markets are also changing. As noted previously, per capita beef consumption has fallen over the last 30 years. A majority of this decline can be explained by price, but some is undoubtedly due to changes in consumers' tastes and preferences that represent new market opportunities for U.S. producers.

Health concerns may contribute to changes in consumer tastes and preferences, but recent research suggests that other socio-economic issues are equally or more important. Most notable among these is the effect that multiple income households may have on fresh meat demand and the demand for beef in general.

Multiple income households are motivated in their purchase decisions by economic considerations that exceed the market price of the food item. As the number of two-income households in the U.S. has grown, time for "at-home" meal preparation has become increasingly scarce. As a result, the cost of time has increased—not in the market, but in terms of the leisure that must be sacrificed. The higher cost of time (in terms of household labor) increases the cost of traditional meals prepared at home. Because of this, the demand for fresh meat as a component of a traditional (prepared at home) meal will fall (Melton, Huffman, and Shogren). At the same time, the demand for convenience foods (e.g., frozen, pre-prepared meals, microwavable dishes, etc.) will increase. Beef has lagged both pork and poultry in the development of more convenient marketing forms for their product. The development of these alternatives will certainly enhance the beef market. However, as a result, the demand for slaughter animals will probably change.

The added post-slaughter processing that occurs (pre-consumer) will add additional value to beef products. It will also allow greater consistency in product quality to be achieved post-slaughter. As a result, the nature of the beef animal demanded may change. That is, the demand for USDA Choice slaughter animals may decline in favor of higher yielding leaner animals that produce meat more amenable to post-slaughter processing. The large number of Holsteins being fed for ground beef is perhaps only an early indication of changes likely to occur as beef animals are increasingly selected and produced for specific product markets. In short, producers will be increasingly called upon to market products rather than sell a commodity. We can thus anticipate specialized markets will become increasingly common. Some animals will be produced and processed for the premium markets (e.g., HRI trade, Certified Angus, etc.), others will be intended for mainstream fresh meat (retail beef), and still others will be intended for processed products including "fast food". The proportions in each class will change over time, but indications are that the processed product market will represent a growing share of beef markets in the future.

In light of these domestic market changes, one must question the generic advertising expenditures of "check-off" funds. The intent of these funds was to expand beef demand. However, at least one scientifically refereed study has shown that generic beef advertising has had no significant effect on beef demand (Jensen and Schroeter).

If the beef industry moves from commodity to product based production, as current trends in consumption would suggest, generic beef advertising may be counter-productive. Furthermore, total beef industry advertising expenditures of about $25 million per year may be so small as to be wasted. A higher value use, if less visible and thus less politically appealing, for the "check-off" funds spent on advertising would probably be for research to develop new beef products and markets. However, such expenditures are normally undertaken by wholesalers, retailers, and processors (e.g., packers). The coordination of these efforts will require scrapping the current model of check-off expenditures in favor of a new, more well-thought-out approach to long-term beef marketing.

Costs and Technology Although opportunities exist in both domestic and international markets, neither can be realized unless the beef product is cost competitive—both with other meats and international beef competitors. U.S. beef producers can produce virtually any product. However, they may not be able to produce it at a low enough cost to be competitive, as evidenced by the declining chicken price and growing poultry consumption.

For U.S. beef producers to be competitive they must have lower costs to the consumer than their competitors. Furthermore, this applies in any beef market (domestic or international), for any beef product, and for other meats. There are essentially two components to cost: (1) the price of inputs and (2) the level of technology.

Input Prices. Prices of inputs are relatively straightforward. In most cases, U.S. input prices are determined in a (more or less) competitive market by the actions of all producers and consumers in that market. However, beef cattle are somewhat unique in their input demands. Beef cattle can use inputs that have essentially no alternative use—forage. There is little competition for this input from pork, poultry, or other domestic livestock. Hence, it has essentially no alternative and, thus, a low price to the beef industry.

In light of this, some might question why the price of land on which forage grows is so high. As a practical matter, its price largely reflects the value of the forage harvested to the beef producer (discounted over time). Thus, beef producers themselves are largely responsible for higher pasture prices. If they were unable to make a profit at those prices, they should not pay as much.

Realistically, however, more than the profit or value of forage becomes involved in land pricing. At least three issues beyond the value of forage come into play in most areas: (1) alternative land uses (e.g., housing, recreation, environmental use), (2) government programs, and (3) a tradition of integrated asset ownership and management.

Alternative land uses and the demands on land for non-productive purposes will increase in the future. These need not be discussed in detail here. Instead, suffice it to say that the U.S. beef producer must accept a certain social responsibility in land use. That is, production practices must be developed and adopted that, within economic boundaries, are consistent with public objectives. If these cannot be accomplished simultaneously, the producer must recognize that the greater social good will most often prevail and that agriculture is in an increasingly small minority. Less than 2 percent of the U.S. population is currently classified as farming. As that number continues to decline, the political reality will increasingly favor a non-agricultural agenda.

In this context, government programs have been both the savior and the scourge of commercial agriculture. The current farm program, often referred to as the "set-aside" or ARP program, targets crop (feed grain) production. Although its premise was to control and reduce grain production through various incentives, including deficiency payments, its actual effect has been to expand grain production. Additional acres of somewhat marginal land were brought into cultivation to receive the cash benefit of the government program. As a result, grain production expanded beyond the set-aside requirement. Because of the greater grain

production, lower grain prices have resulted and beef producers, especially cattle feeders, have benefited.

To combat the problems of increased marginal land cultivation accompanying the ARP program, the government enacted the Conservation Reserve Program (CRP). This program allowed producers to take marginal land out of cultivation for a period of ten years, during which the government would pay an annual "lease" on the lands. Those lands removed from cultivation under CRP were required to be planted in grass (forage), but the forage production could not be harvested either by grazing or baling.

Many cattlemen look forward to the expiration of the CRP contracts with great anticipation. They expect that the millions of acres of grass established under CRP will become available for beef cattle, productivity under government programs. Hence, land is bid away from grazing toward cultivation and land prices in general rise—for both crop and pasture land.

The debate over balancing the budget brings farm programs to the table. It seems clear that if Congress is serious about balancing the budget, agricultural payments must be dramatically reduced. Such reduction will, in time, allow land resources to be allocated according to true values. However, the allocation process will be painful for both crop and livestock producers. Estimates are that if current programs were eliminated land prices in Iowa, for example, would fall by about 25–35%. Hence, a $1700 per acre farm would lose about $400–$500 per acre in value. Similarly, a $300 per acre ranch would lose about $100 per acre in value. For many producers, such a loss in asset value would be insurmountable. Their equity would simply not support it and they would be forced into bankruptcy.

This possibility relates directly to the third issue of land price and ownership. Agriculture has traditionally been based on the individual producer who owns his own land. It has become so ingrained that many potential producers cannot enter the industry for lack of the necessary capital. Those that

either as hay or grazing, and as a result, their input (feed) costs will decline.

As a practical matter it is doubtful that the expiration of the CRP contracts will have a significant effect on forage supply. As long as the current ARP program exists, farmers will still have an incentive to plow marginal acres—even if they are only used to satisfy set-aside requirements. Estimates are, for example, that up to 90 percent of the CRP acres in Iowa will simply be plowed on expiration of the current contracts. Hence, the CRP acres will have little or no effect on either forage or grain cost.

These programs do, however, have significant effects on land price. Marginal acres, that should be allocated to grazing rather than cultivation, receive an annual value greater than their do have the requisite equity and financing bid up the price of land, causing land prices in general to rise.

In this regard, agriculture is unique among U.S. industries. Agriculture is the only U.S. industry in which a separation of asset ownership and asset management has not developed. One reason for this is the low rate of return on agricultural assets that will not attract investment capital. In the future, this structure will probably change—especially as the capital requirements increase. Agricultural producers will increasingly become asset managers rather than asset owners.

Technology. The role of management in agriculture is becoming increasingly important. It is one of the key elements of technology and technological change frequently overlooked in cost studies.

Huffman and Evenson have examined long-term trends in agricultural technology. They found that overall livestock have fared far worse than crops, with annual rates of return to technology in the range of only 2 to 3 percent, compared to about 12 percent in crops. Hence, crops have tended to become more cost efficient to produce relative to livestock. In short, livestock have not received substantial technological benefits from research.

Management is one reason for the lack of technological benefits. Poultry, as it became increasingly integrated, adopted management practices aimed at efficiency and capitalizing on available technology. Beef production has not, as evidenced by the fact that it took beef production 20 years to widely adopt crossbreeding after its development and benefits were proven. As a result, poultry production has realized a much higher rate of return from technology than beef production. Beef managers will have to become more sophisticated in the future if the gap is not to widen. That means more sophisticated in both the science of their business and the business of their production.

The challenges of improving cost through new and better technologies extend beyond beef managers. The Land Grant university system has been the primary research and development arm of agriculture. Scientists at Land Grant universities must focus on problems of commercial beef production that will have immediate and substantial pay-offs. That is not to say that basic research must be abandoned. It is, instead, a matter of balance. Basic research that will not yield a commercial technology for 20 years will be valuable in 20 years, but beef producers also need help now. Some effort must be devoted to these issues.

A classic example is in genetic change. Biotechnology and genetic engineering have become major thrusts at most universities. They are politically appealing and thus attract funds. However, even under the most aggressive of assumptions, they will not be commercially applicable for many years. At the same time, beef producers need information on genetic change now.

One area where such changes could be made is in the national sire evaluation. At present, an excellent national system of sire evaluation allows individual sires to be compared within breeds across the nation, through Expected Progeny Differences (EPD). This information has been widely accepted by seedstock producers and used extensively in sire marketing. However, it often has much less meaning to commercial producers who want to know, How does one breed compare to another in my geographic location and management system? Providing such information requires that EPD be expanded to include genetic by environmental interactions, as well as across breed comparisons. That is, at present a superior sire is superior only within his breed relative to the national average of the breed. If the system were revised, the superiority of a sire would be cast in terms of breed effects by geographic region and management system, as well as the sire within the breed. Such changes will be forthcoming, but only if demanded by producers.

Summary

As we look ahead to the next decade we see a variety of opportunities for the U.S. beef producer. We also see challenges that many may not be prepared to meet. Specific issues are as follows:

- Beef is no longer consumed in the same quantities as it has in the past; but much of this can be attributed to beef's higher price, relative to other meats. As a result, beef's share of consumer expenditures has changed little in the past 30 years.
- Expanded international markets, such as NAFTA and GATT, will not be the answer to problems facing U.S. beef producers. Under NAFTA, Mexico may actually become a beef exporter, further increasing the competition faced by U.S. producers. To compete successfully in international markets, U.S. beef producers must abandon the idea that U.S. beef is *"best"* and compete on a price basis with other countries and meats for the product consumers desire.
- Domestic markets are affected by prices of competing products, as well as the socio-economic changes occurring in the economy at large. Multi-income households, for example, will not pay as much for fresh beef because of the time required in preparation.

Hence, processed beef products in consumer-convenient form will be a growing share of the beef market. In light of this, generic advertising, such as funded through beef "check-off" funds, is probably not an especially effective use of beef producer funds in domestic markets.

- In combination, these market changes suggest that U.S. producers must increasingly become *product marketers* rather than *commodity sellers*. They must produce specific products for specific market requirements.

  enterprise (it uses resources that are not used by other species), changes in beef production to accommodate specific product markets at lower prices than current are possible.
- Despite the emerging market changes and generally rising input prices, U.S. producers must increase their cost efficiency. It is doubtful that beef will ever be subject to the degree of integration pressure facing poultry and pork, or that they will capture the efficiency gains such integration may promote. However, they will face the same pressures to improve technology in both management and production. Revised EPD procedures and greater business expertise in management are just two of the steps that should be undertaken.

As when anyone looks into the future, there is considerable fuzziness. These prospects are no

- Lower prices would improve the competitive position of U.S. beef production in either domestic or international markets. It is doubtful, however, that input prices will fall substantially, due to the CRP release. However, the reduction of all government programs would improve beef's cost following the trauma that would be introduced with lower land prices, etc. Furthermore, recognizing that beef production is a scavenger

different. However, they represent what many would view as a reasonable alternative. Whether any of the prospects come to fruition depends on the decisions made today; Tomorrow is not yet written.

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