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An Overview of the U.S. Beef Industry

Since the time that early humans first painted pictures of cattle on cave walls and took their first taste of beef, the bovine has played a role in the existence of humankind. Whether as a source of wealth, food, clothing, or draft power, cattle have evolved in a symbiotic relationship with people.

The Europeans who first imported cattle to the Americas could not have envisioned the size and scope of the beef industry that would eventually develop in the New World. The cowboys on the trail drives of the late 1800s would not have been able to foresee the changes in the infrastructure and marketing system that allowed the beef industry to move away from a commodity paradigm and toward that of a value-added, consumer-driven business.

The evaluation of agricultural systems has been ongoing for centuries, and the emergence of the beef cattle industry resulted from the recognition that domestication of cattle and other livestock would result in a consistent supply of food, fiber, and draft power. The organizational structure of the industry became increasingly complex when the advances of the industrial age allowed rapid increases in production efficiency, permitting people to pursue vocations other than producing their own food supply.

The scientific and information breakthroughs of the last century have heightened agricultural productivity to the point that fewer than 2% of U.S. citizens are directly employed in production agriculture.

However, as fewer people understand or participate in food production, leaders of the beef industry and the agricultural commodities find it important to increase the level of communication between producers, processors, retailers, and consumers. The beef industry has always faced challenges and the present and future are no different. Nonetheless, the relationship between the stock producer and his or her cattle is one with the potential to yield enormous benefits for humans. The thoughtful and diligent study of the beef industry, its associated infrastructure, marketplace, and management offers people the opportunity to apply creativity and energy to a fundamentally important endeavor.

GENERAL OVERVIEW

The beef industry includes breeding, feeding, and marketing cattle with the eventual processing and merchandising of retail products to consumers. The process involves many people and utilizes numerous biological and economic resources. Most important, however, is the time involved: depending on the production alternatives, approximately 2 to 3 years are required from breeding time until a beef product can be made available to consumers (see Figure 1.1).

Leaders and managers across the beef supply chain must have a comprehensive knowledge of the industry if they are to be most successful both individually and

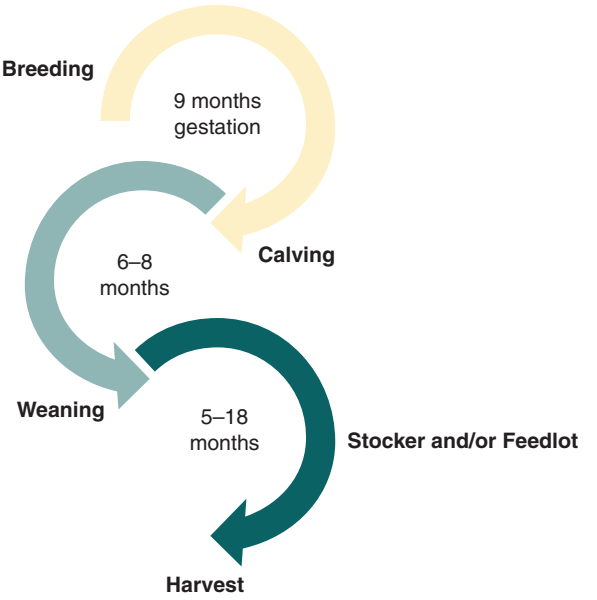


Figure 1.1
Beef production cycle.

collectively. Developing a systems management mindset is critical to develop profitable and sustainable enterprises in the beef industry.

Numbers, Prices, and Consumption

The beef industry involves people (cattle producers, processors, and consumers), products (number of cattle, pounds produced and consumed), prices, and profitability. Figure 1.2 shows the cattle inventory in the United States over the past 60 years. Beef and dairy numbers are combined because the dairy industry contributes a significant amount of production to the U.S. industry. Cattle numbers increased rapidly from the early 1900s until the mid-1970s, when a dramatic decline occurred. The cattle inventory of approximately 90 million head in 2015 represents 68% of the peak numbers of 132 million head in 1975. While a modest herd rebuilding process began in 2014, the national cattle herd is likely to remain between 89 and 93 million head for the foreseeable future. There have been significant peaks and valleys in cattle numbers resulting from factors influencing the supply and demand of beef. These cycles reflect the profitable and unprofitable periods of the cattle industry. The influence of cattle cycles in marketing cattle is discussed in detail in Chapter 9.

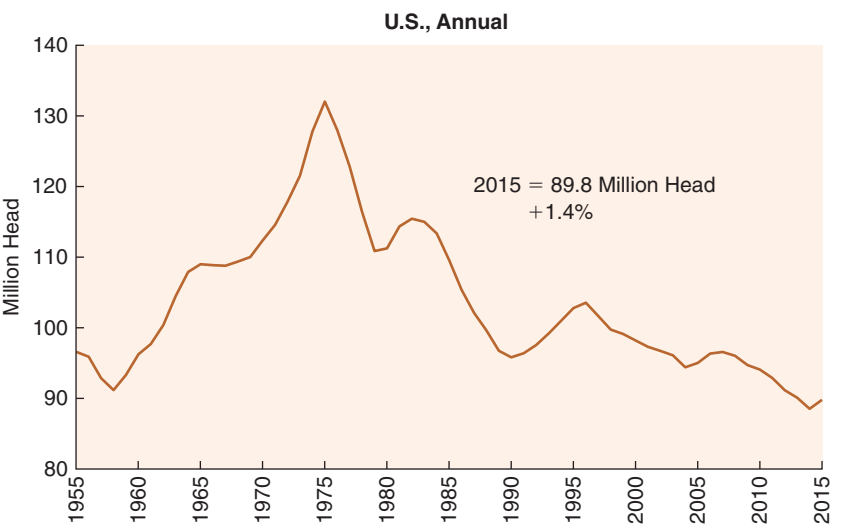


Figure 1.2
Total cattle inventory (1955–2015).
Data source: USDA National Agricultural Statistics Service; compiled by Livestock Marketing Information Center.

Table 1.1
CATTLE NUMBERS AND PRICES, HUMAN POPULATION, AND BEEF CONSUMPTION IN THE UNITED STATES, 1925–2015

Year	Human Population (mil.)	No. Cattle (mil.)	No. Beef Cows (mil.)	Carcass Beef Produced (bil. lb)	Per Capita Retail Beef Consumption (lb)	Choice Fed Steer Price ($/cwt)	Retail Choice Beef Price ($/lb)
1925	115.0	63.4	11.2	6.9	44	10.16	0.30
1930	122.8	61.0	9.1	5.9	36	10.95	0.35
1935	126.9	68.8	11.1	6.6	39	12.32	0.30
1940	131.8	68.3	10.7	7.2	41	11.86	0.29
1945	139.2	85.6	16.5	10.3	37	17.30	0.33
1950	151.1	78.0	16.7	9.4	47	28.88	0.75
1955	164.0	96.6	25.7	13.2	62	26.93	0.67
1960	179.3	96.2	26.3	14.4	63	25.90	0.80
1965	193.0	109.0	33.4	18.3	75	24.99	0.80
1970	201.9	112.4	36.7	21.5	85	29.45	1.00
1975	213.8	132.0	45.4	23.7	88	45.21	1.52
1980	227.2	111.2	37.1	21.6	77	65.64	2.34
1985	237.9	109.6	35.4	23.7	79	62.99	2.29
1990	249.4	95.8	32.4	22.7	68	74.71	2.81
1995	262.8	102.8	35.2	25.2	67	65.01	2.84
2000	282.2	98.2	33.6	26.9	68	69.64	3.07
2005	295.7	95.0	32.7	24.7	66	87.27	4.09
2010	310.2	94.1	31.4	26.4	60	95.03	4.38
2015	321.8	89.1	29.3	24.3	54	157.74	6.29

Source: USDA.

Table 1.1 highlights some important data about the cattle industry from 1925 to 2015. Changes in population, cattle numbers, product consumption, live cattle prices, and average retail prices impact the industry.

Figure 1.3 illustrates the relationship between cattle numbers and carcass beef production. Since 1979, cattle numbers have decreased significantly. Carcass beef production declined initially, remained relatively stable in the 1980s, and then increased in the last half of the 1990s, partly due to Canadian imports. The disruptions caused by

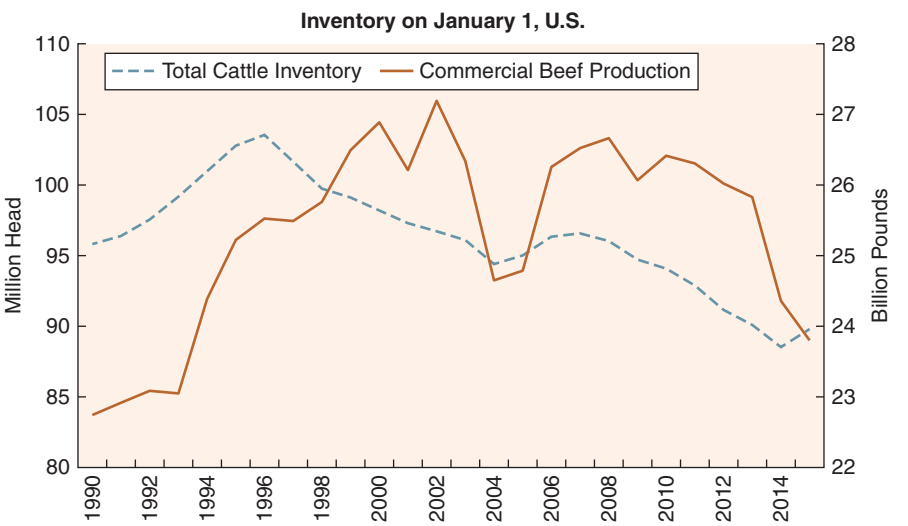


Figure 1.3
Beef production versus cattle inventory (1990–2015).
Data source: USDA National Agricultural Statistics Service; compiled by Livestock Marketing Information Center.

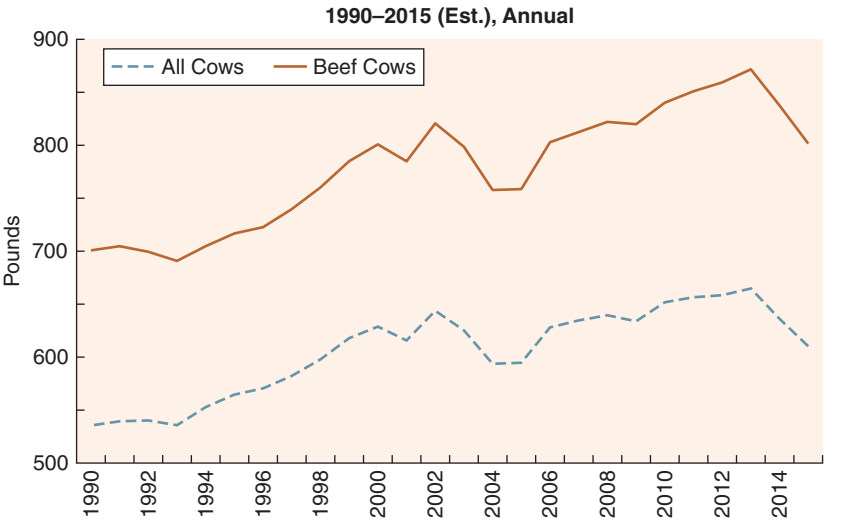


Figure 1.4
Beef production per cow (1990–2015).
Data source: USDA National Agricultural Statistics Service; analysis and compiled by Livestock Marketing Information Center.

Bovine spongiform encephalopathy-related trade restrictions shut off Canadian imports for a period of time in the mid-2000s, resulting in the decline in beef production. Supplies then normalized before falling as the result of a declining beef herd in both Canada and the United States. Total beef production has been maintained despite inventory changes for the most part over the past 40 years. There are several reasons for these trends: (1) most importantly, average carcass weights have increased from 613 lb in 1970 and 635 lb in 1980 to 750 lb in 2004; (2) the feedlot turnover rate has increased from 2 times capacity to 2.4 times capacity, resulting in more cattle available for slaughter; (3) the slaughter age of fed cattle has decreased; (4) the genetic base for heavier cattle at a given age has increased (due to more crossbreeding, increased emphasis on growth in British breeds, and utilization of more Continental breeds by commercial breeders); and (5) increased importation of cattle and beef. As a result, there has been an increase in the amount of beef produced per cow in the breeding herd (Figure 1.4). The slight decline in per animal production since 2013 is partly due to short-term supply and demand conditions.

CONTRIBUTION TO THE U.S. ECONOMY

Cash receipts received annually from the sale of all agricultural products in 2016 are forecast to be approximately $367.5 billion: $190 billion originating from livestock and livestock products, including $74 billion from cattle. Figure 1.5 shows state-by-state cash receipts from the sale of cattle and calves. Nineteen states have greater than $1 billion in receipts. Obviously, the existence of cattle and their production support many other industries that add billions of additional dollars to the U.S. economy. For example, animal health product sales total nearly $2 billion. Other multimillion and multibillion dollar industries—feed, finance, publications, equipment, marketing, AI, and others—are also highly dependent on cattle. The income generated by the beef industry yields a $3 to $5 multiplier effect in the overall economy.

BEEF INDUSTRY SEGMENTS

The term beef industry implies that the beef production system is a unified operation subject to an overall management program. However, the beef industry is actually made up of several different segments (Table 1.2) that are linked together through

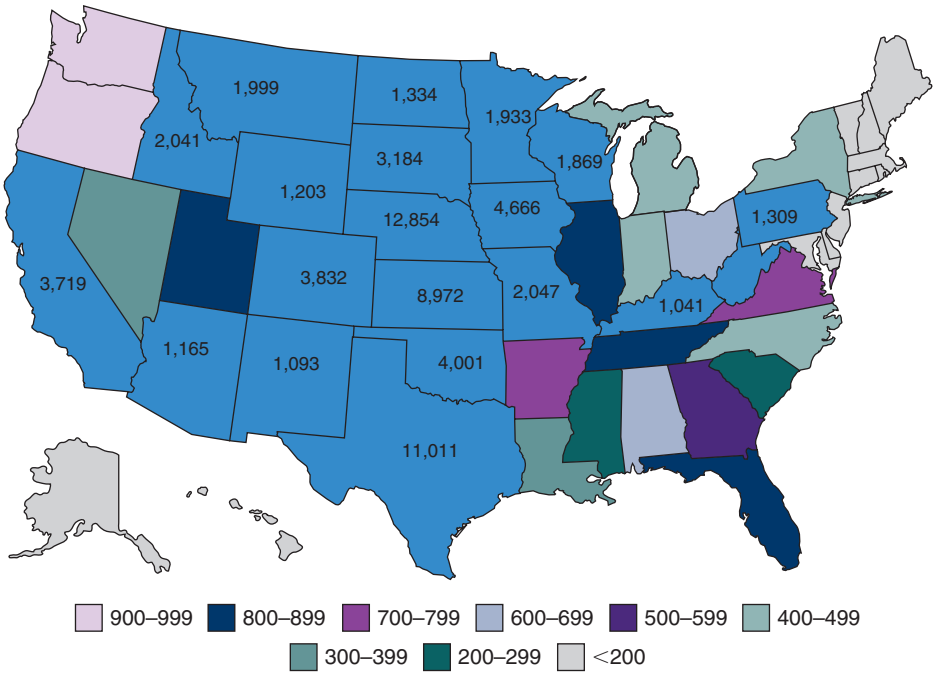


Figure 1.5
Cash receipts (million $) from sale of cattle.
Source: Adapted from USDA (*Agricultural Statistics*, 2015).

beef animals and products, yet the segments operate somewhat independently from each other. Each segment has different economic parameters and management problems and markets different products. In some cases, segments are in direct competition with one another. In some respects, the various beef industry segments can be considered separate industries because of their distinctly different characteristics.

The Seedstock Segment

Seedstock breeders, sometimes referred to as *purebred breeders* or *registered breeders*, are specialized cow-calf producers. Seedstock breeders are predominantly responsible for identification and propagation of genetics that contribute to the profitability of the industry.

Seedstock breeders sell genetic information, breeding animals, semen, and embryos to other breeders and commercial cow-calf producers. Their function is one of service—to provide the genetics that can be economically utilized by the beef industry. The breeders sell breeding animals primarily to commercial cow-calf producers within a 100- to 150-mile radius of the breeders' operations. Choice of breed—whether one or a combination of breeds—is important in developing a production and marketing program that can best serve the commercial producers in any given area.

The seedstock segment is discussed in further detail in Chapter 4. Chapters 12 and 13 cover the biological relationships for making genetic changes in the economically important traits of cattle.

The Commercial Cow-Calf Segment

Commercial cow-calf producers maintain cowherds and raise calves from birth to weaning. Under ideal conditions, each cow is expected to produce one calf annually. Calves are the primary source of revenue for the commercial producer as well as the source of heifers to replace breeding cows that are culled.

Table 1.2
OVERVIEW OF THE U.S. BEEF INDUSTRY (PRODUCTION AND CONSUMPTION)

Segment	People/Companies	Cattle/Products	Tenderness/Palatability
Seedstock	*Marketings:* Top 25: 29,600 hd Top 10: 20,065 hd Top 5: 14,395 hd 8 AI studs	Approx. 80 cattle breeds (10 breeds are most important, while 5 breeds contribute approx. 60% of the genetics); primarily yearling bulls, semen, and AI certificates	British breeds highest Brahman breed lowest Genetic variation for tenderness exists within a breed
Cow-calf (yearling stocker)	727,906 producers cow herds <50 head have 20% of cows but 80% of all operations; 45% of cow inventory in herds >100 hd Top 25: 259,400 hd Top 10: 177,300 hd Top 5: 124,700 hd	29.7 mil. hd beef cows 9 mil. head dairy cows 88% calf crop 525 weaning wt	Highly variable based on breed, implant protocol, age, and assorted other factors
Feedlot	1,781 feedlots with >1,000 hd capacity in 12 major states Top 20 capacity: 4.7 mil. hd Top 10 capacity: 3.4 mil. hd Top 5 capacity: 2.4 mil. hd	13.1 mil. fed cattle capacity	
Packer	Top 10 daily harvest: 106,275 Top 5 daily harvest: 96,075	30.2 mil. cattle slaughtered 23.7 bil. lb carcass wt *Quality graded (2004)* Prime (4%), Choice (66%), Select (30%) *Yield graded (2004)* 1 (8%), 2 (36%), 3 (46%), 4 (9%), 5 (1%) avg. carcass wt (750 lb,all cattle)	min. fat (0.3 in.) prevents cold shortening; electrical stimulation; improves tenderness, aging (14–21 days) increases tenderness
Retailer	38,015 supermarkets with more than $2 mil. in annual sales	Annual per-capita distribution: hamburger (28 lb); steaks/roasts (30 lb); processed (9 lb)	
Purveyor	More than 300 companies	Center-of-the-plate products	Emphasize high palatability
Consumer	Population: United States (293 mil.) World (5.9 bil.)	*Per-capita consumption (2015)* *Retail* / *Boneless* Beef 56 / 52 Pork 49 / 46 Poultry 105 / 66 per-capita U.S. expenditures for beef: $324	steaks cooked higher than "medium" tend to be less tender and drier; per capita total fat consumption at all time high (fat and taste preferences are highly related)
Exports	Primarily to (1) Japan, (2) Mexico, (3) South Korea	2.5 bil. lb (carcass beef) valued at $6.5 bil.	
Imports	Primarily from (1) Australia, (2) Canada, (3) New Zealand	3.0 bil. lb valued at $2.4 bil.	Mostly in the form of ground or manufacturing beef

Table 1.2
(Continued) Current U.S. Beef Industry (financial and economic)

Segment	Costs	Prices	Profits/Returns
Seedstock		$2,000–8,000 (to commercial producers); semen $5–50/unit; AI certificates ($10–150)	
Cow-calf	*Annual cow cost* High 1/3 ($800) Avg. ($650) Low 1/3 ($400)	*450 lb* 1997 ($89/cwt) 2004 ($129/cwt) 2014 ($271/cwt)	1991 (+$55/cow) 1996 (–$80/cow) 2000 (+$80/cow) 2004 (+125/cow) 2014 (+$550/hd) 2017 proj. (+$250/hd)
Yearling/stocker		*750 lb* 1993 ($85/cwt) 1997 ($74/cwt) 2000 ($86/cwt) 2004 ($104/cwt) 2015 ($207/cwt)	*Summer Program* 1986 (+$25/hd) 1991 (–$5/hd) 1996 (+$40/hd) 2000 (+$20/hd) 2004 (+$125/hd) 2014 (+$375/hd) 2015 (–$75/hd)
Feedlot		*Fed Steer* 1993 ($76/cwt) 1997 ($66/cwt) 2004 ($84/cwt) 2015($150/cwt)	1986 (+$26/hd) 1991 (–$40/hd) 1996 (–$10/hd) 2000 (–$5/hd) 2004 (+$25/hd) (+$25) 2015 (+$300/hd)
Packer		*By-product Value* ($/cwt of live weight) 1995 ($9.60/cwt) 1997 ($10.30/cwt) 2003 ($10.12/cwt) 2004 ($9.27/cwt) 2015 ($12.85/cwt)	*Wholesale Boxed Value ($/lb)* 1986 ($0.95 lb) 1991 ($1.18 lb) 1996 ($1.03 lb) 2000 ($1.17 lb) 2003 ($1.44 lb) 2015 ($2.37 lb)
Retailer		Retail price (Choice; Avg. of all cuts) $6.28/lb	Supermarket Sales *1983* *1993* *2002* *2015* Beef (bil. $) 26.8 21.1 22.1 24.6
Consumer		Market Share % of meat expenditures *1990* *2004* *2014* Beef 42 43 46 Pork 27 27 27 Poultry 31 29 27	Beef expenditures were $324 per capita. Total consumer spending on beef exceeded $60 bil. for the first time in 2002 as well as in 2003, $70 bil. in 2004

Changes in cow numbers over the past 20 years reflect a reduction in beef cows and a relatively stable inventory of dairy cows (Figure 1.6). Distribution of beef cows by state is shown in Figure 1.7. Note the concentration of beef cows in the Great Plains. This area—which covers Texas north through North Dakota and the eastern parts of New Mexico, Colorado, Wyoming, and Montana—accounts for approximately 50% of the total U.S. beef cow population. The Corn Belt and southeastern states also have significant numbers of cows.

Changes in beef cow numbers by states over the past decade are reflected in Figure 1.8. The changes are primarily related to market conditions and forage supply.

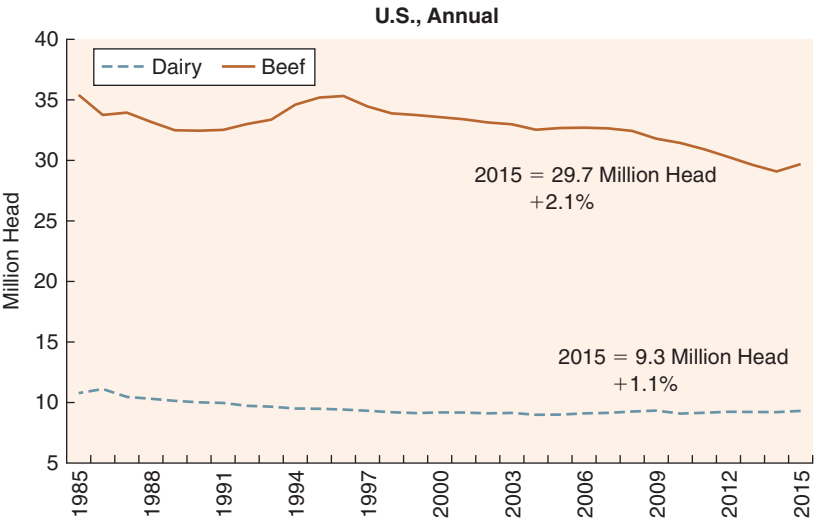


Figure 1.6
U.S. cow inventory (1985–2015).
Data source: USDA National Agricultural Statistics Service; compiled by Livestock Marketing Information Center.

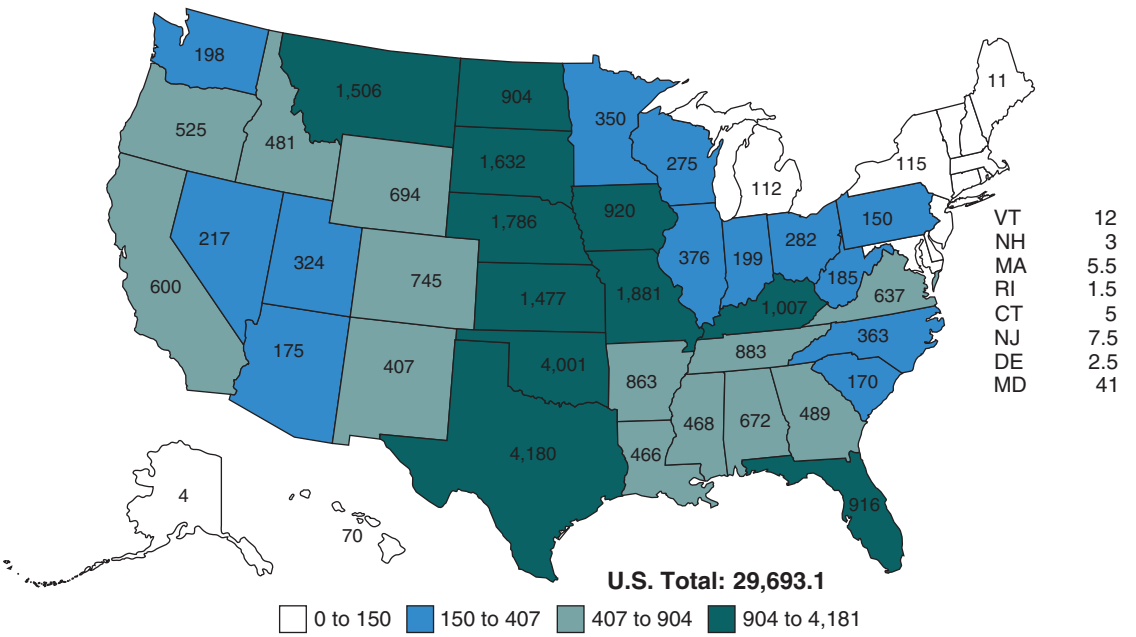


Figure 1.7
Beef breeding cows, January 2015 (1,000 head).
Data source: USDA National Agricultural Statistics Service; compiled by Livestock Marketing Information Center.

The latter can be dramatically influenced by drought, renovation of previously unproductive land, water development, and shifts in land use between crops and forages. The significant increase in crop prices that occurred from 2010 to 2013 coupled with the growth of the ethanol business increased the cost of production for the cattle industry and motivated many agricultural producers to swap pasture acres for row crops. Varying sections of the United States endured drought conditions from 2000 to 2015 that also drove down the size of the U.S. cow herd.

Figure 1.9 shows that nearly 80% of beef cow operations have fewer than 50 head of cows, while controlling less than 30% of the cow inventory. The small herd size is not surprising because part-time farmers operate about one-half of U.S. farms, and many of their farms are less than 50 acres in size. Approximately 55% of beef cows are in herds of greater than 100 head. Yet, only 10% of enterprises are in this size category.

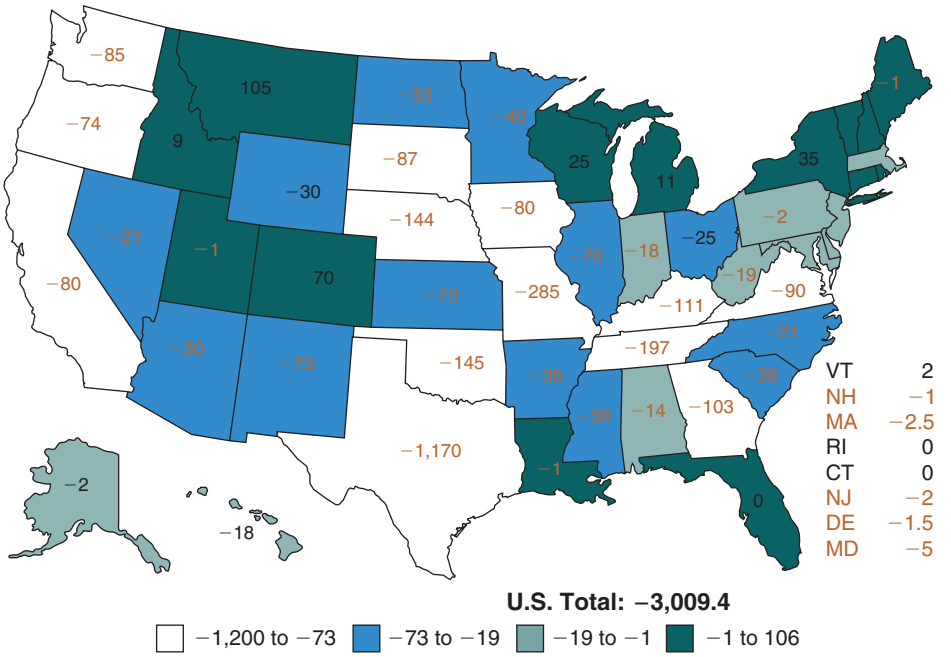


Figure 1.8
Change in beef cow numbers (2006–2015) per 1,000 head.
Data source: USDA National Agricultural Statistics Service; compiled by Livestock Marketing Information Center.

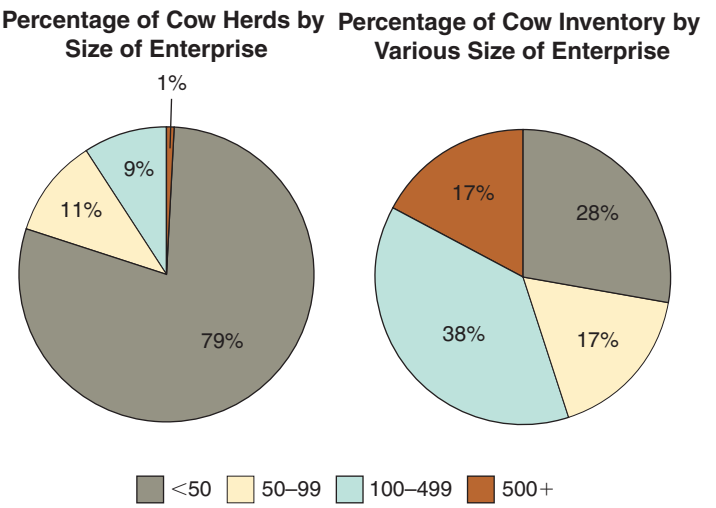


Figure 1.9
Percentage of cow herds in various size groups—2004; percent of cow inventory in various size groups—2004.
Source: Adapted from USDA-NASS.

Herd sizes of 300 cows or more are considered to be an economic unit, so there are numerous small beef cow operations that are supplemented with outside income. Increase in cow herd size does not always imply an increased efficiency of production. However, several studies demonstrate that there is a greater return per head as cow herd size increases toward 1,000 head. Although there are intensive cow-calf operations where cows are maintained under conditions comparable to large dairies year-round, the vast majority are extensively managed operations where cows are maintained on grazed and harvested forage throughout the entire year. Many cow-calf operations

are extensively managed in high mountain valleys, plains, and desert areas where 30–100 acres are required per cow, with some supplemental feeds provided. Some cows are maintained on more intensively grazed areas where 1–5 acres per cow are utilized for 5–10 months during the year.

Most cows will calve in late winter and early spring with the majority of calves being born in February, March, and April. Some producers calve their cows in late spring, summer, or fall, primarily to reduce losses from calf scours and to complement their forage production program. Other producers may have both a spring and a fall calving program to extend the use of their bulls and to use their labor and forage more efficiently. A few producers continue to calve on a year-round basis; however, critical economic assessments usually do not favor this type of calving program.

Calves are usually weaned at the same time of year, their ages ranging from 5 to 10 months. Weaned calves that are heavy (more than 500 lb) may go directly into the feedlot, but the majority of the lighter calves currently are grown out on forage for several months before entering the feedlot.

Cow-calf pairs will graze thousands of acres of grasses, legumes, and forbs that can be effectively utilized by ruminants. In many wheat and other small grain-producing areas, cattle will graze green growth in the fall and early spring, and then graze straw aftermath following the harvesting of grain. Cows graze untillable acres and crop aftermath throughout the United States. Cornstalk aftermath for grazing in the fall is very important in the major corn growing regions.

A more detailed discussion of the commercial cow-calf segment is provided in Chapter 5.

The Yearling-Stocker Segment

The yearling-stocker operator is responsible for adding weight to weaned calves prior to their shipment to feedlots for additional weight gain prior to harvest. The calves are usually yearlings (12–20 months of age) by the time they enter the feedlot. Some heavier weaning calves (more than 500 lb) may go directly to the feedlot, bypassing the yearling-stocker phase.

The yearling-stocker operation usually has available forage—pasture, hay, and silage—for feeding during winter months and grazable forage for the spring, summer, and fall months. In spring calving programs, short yearlings (10–14 months of age) may go to feedlots after the winter feeding program, whereas long yearlings (15–20 months of age) will be marketed in the fall following a summer grazing program.

Yearling-stocker operators purchase calves in the fall and/or spring depending on the availability and cost of forage. Some commercial cow-calf operations retain ownership of their calves through the yearling growth stage. Cattle feeders sometimes purchase calves and maintain ownership through both the growing and feedlot phases. These two alternatives are increasing in frequency, making the traditional yearling-stocker operation a minor beef industry segment.

The yearling-stocker segment of the beef industry is discussed in more detail in Chapter 6.

The Feedlot Segment

Feedlots are confinement feeding operations where cattle are fed primarily finishing (high-energy) rations prior to harvest. Most feedlot operations feed relatively high grain rations for 100 to 200 days for economically efficient gains and to improve the palatability of the retail product. Some operations background cattle by feeding them primarily roughage rations prior to the finishing phase.

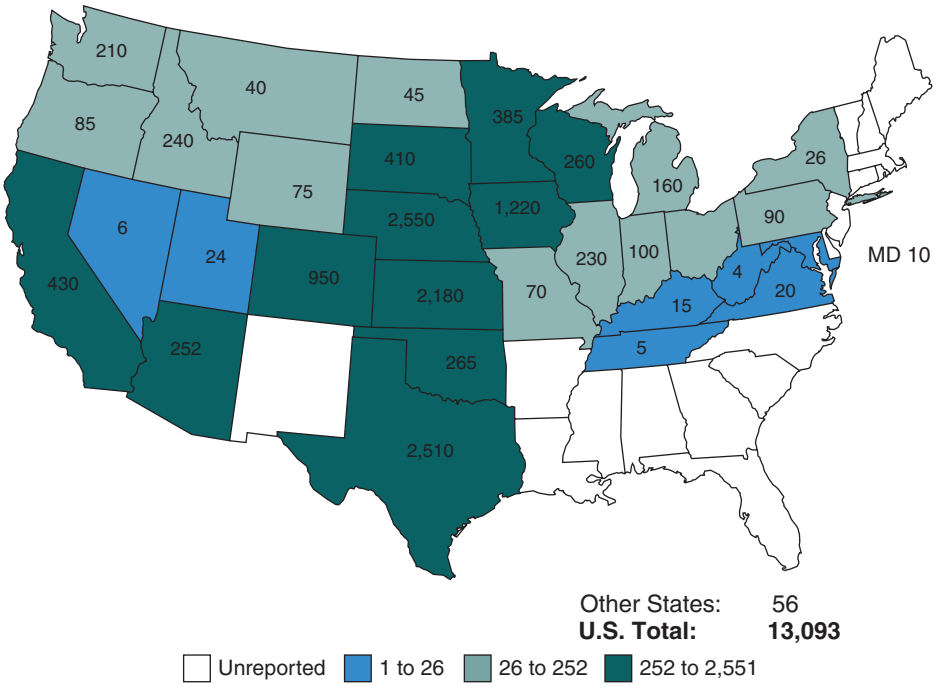


Figure 1.10
Cattle on feed, January 1, 2015 (1,000 head).
Data source: USDA National Agricultural Statistics Service; compiled by Livestock Marketing Information Center.

The number of cattle on feed is shown in Figure 1.10. Commercial cattle feeders annually feed and market approximately 2.5 times the one-time feedlot capacity. Cattle-On-Feed reports from the USDA usually give information for only the top 12 states as these 12 states feed >98% of the cattle. Note the concentration of cattle feeding in the Plains states. The primary reasons for this distribution of fed cattle are the availability of feed grains, the locations of packing plants, and the climatic and geographic conditions that favor cattle feeding.

Feedyards located in the eastern half of the upper midwestern states and east into the Corn Belt tend to have smaller capacities per feedlot as compared with the western and southern regions of the Great Plains and southwestern states. The southern and western tiers of feedlot states have larger feed yards due to more arid and consistent climatic conditions. The larger yards are also typically the primary enterprise of focus by management, whereas, in the Corn Belt region, the feeding enterprise is typically part of an integrated farming business.

The number of lots, inventory, and marketings by size of feedyard are provided in Table 1.3.

Table 1.3
NUMBER, CATTLE ON FEED, AND ANNUAL FED CATTLE MARKETINGS BY SIZE OF FEEDYARD, 2015

Feedyard Capacity (*N* of head)	Lots (*N*)	Inventory (1,000 hd)	Marketings (1,000 hd)	Turnover[1]
<1,000	25,000	2,602	2,895	1.11
1,000–1,999	820	355	650	1.83
2,000–3,999	580	660	1,230	1.86
4,000–7,999	340	900	1,740	1.93
8,000–15,999	180	1,210	2,250	1.86
16,000–32,999	141	1,890	3,430	1.81
32,000+	128	5,560	10,360	1.86

[1]Turnover would be higher when cattle inventories are higher.

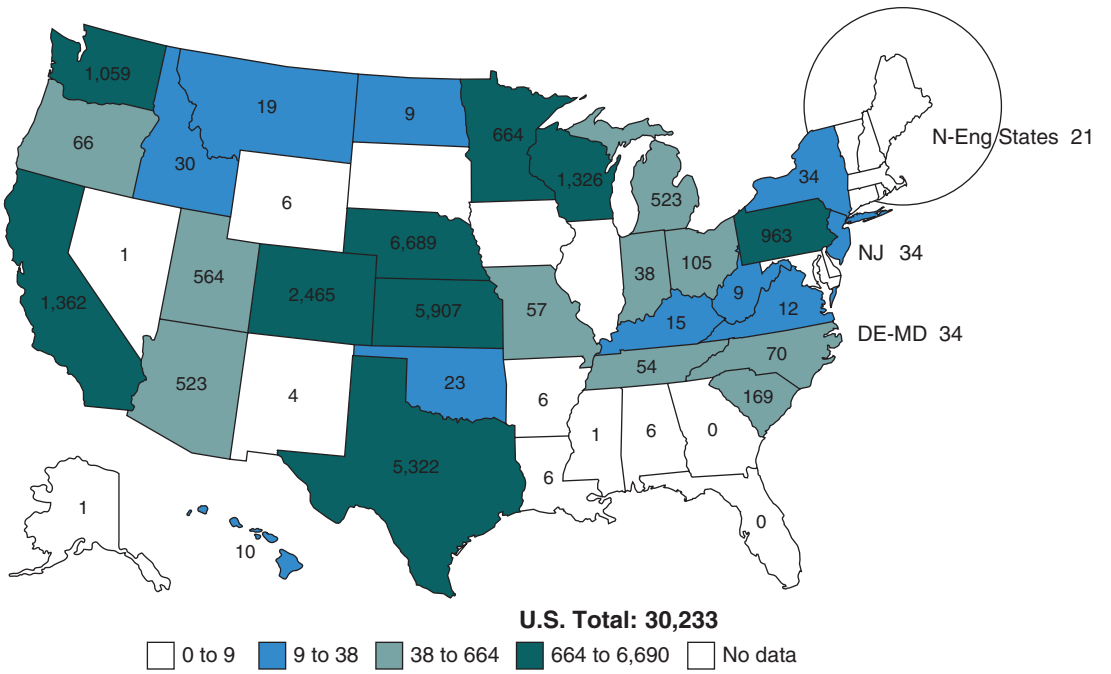


Figure 1.11
Commercial cattle harvest, 2014 (1,000 head).
Data source: USDA National Agricultural Statistics Service; compiled by Livestock Marketing Information Center.

The Packing Segment

The distribution of fed cattle harvested in the various states is shown in Figure 1.11. Cattle are harvested in the same geographical areas where feedyards are located (compare Figures 1.10 and 1.11). Table 1.4 identifies the major packing companies and their capacities. The packing industry is one of the most regulated businesses in the United States and has highly volatile margins. These factors coupled with capitalization and labor challenges led to the closing of nearly 200 beef packing plants between 1975 and 2015.

Table 1.4
LEADING 10 BEEF PACKERS IN THE UNITED STATES, 2015/2016

Name	Daily Harvest Capacity	Sales (bil. $)	All Plants (*N*)[1]	Total Employees[1]
Tyson Foods, Inc.	28,950	19 (est.)	95	63,500
JBS Beef Company	27,125	18	45	113,000
Cargill Meat Solutions	23,000	11.5	30	26,600
National Beef	12,000	8.2	6	8,100
American Food Group	NA	3.2	10	4,000
Greater Omaha Packing Company, Inc.	2,800	1.4	1	900
Nebraska Beef, Ltd.	2,800	NA	1	1,000
Caviness Beef Packers, Ltd.	1,700	0.17	2	750
Agri Beef Company	1,600	NA	1	900
Sam Kane Beef Processors, Inc.	1,600	NA	1	650

[1]All operations including beef, pork, lamb, and poultry.
Source: Adapted from multiple sources.

Packers, purveyors, and retailers harvest, process, and distribute approximately 24 billion lb of beef. The magnitude of the beef packing industry as reflected by the number of cattle harvested is shown in Figure 1.12. Of the total annual beef harvest, approximately 80% are fed steers and heifers. The smaller number of non-fed steers and heifers along with cull cows and bulls (that are harvested) receive little or no concentrate feeding prior to slaughter. Their rations have been primarily grass and other forages. The number of non-fed heifers, cows, and bulls harvested varies in response to climatic and profit conditions at the cow-calf level.

Beef sold from packing plants is primarily boxed (>80% of the beef slaughtered). The boxed beef is primal and subprimal cuts from which much of the bone and excess fat has been removed. The cuts are vacuum packaged for a longer shelf life. Boxing of beef has proven to be more cost efficient at the packing plant level because (1) labor rates are usually lower at packing plants than those at retail stores, (2) cutting is usually faster and more efficient as it is done on a moving "disassembly" line by specialized meat cutters, (3) a larger volume of retail product can be handled in less space, (4) more effective use can be made of bone and fat by-products, and (5) transportation costs are reduced, with a more valuable product that can be more easily handled than carcass beef. Retailers have an advantage in buying only those beef cuts that can be more easily merchandised without accepting the entire carcass. In addition, retailers have less spoilage because vacuum-packaged meat has a longer shelf life than carcass beef.

Packers have a preference for carcasses weighing in excess of 800 lb. Given the high fixed costs associated with a packing plant, a key strategy to assure profit is to drive high production volume. Increasing carcass weights is one means to increase plant productivity. Packers merchandise case-ready beef that has been fabricated and packaged either fresh or precooked as a means to capture value. The primary advantages of case-ready products are improved control over food safety, lowered labor costs, improved consistency and yield, enhanced inventory control, and direct delivery of products oriented to consumer preference. The move to case-ready products is a significant development in the industry.

The Purveyor Segment

A meat wholesaler, sometimes called a "jobber," is an operator who purchases beef and sells it to a retailer or to another wholesaler. **Purveyors** and distributors are two types

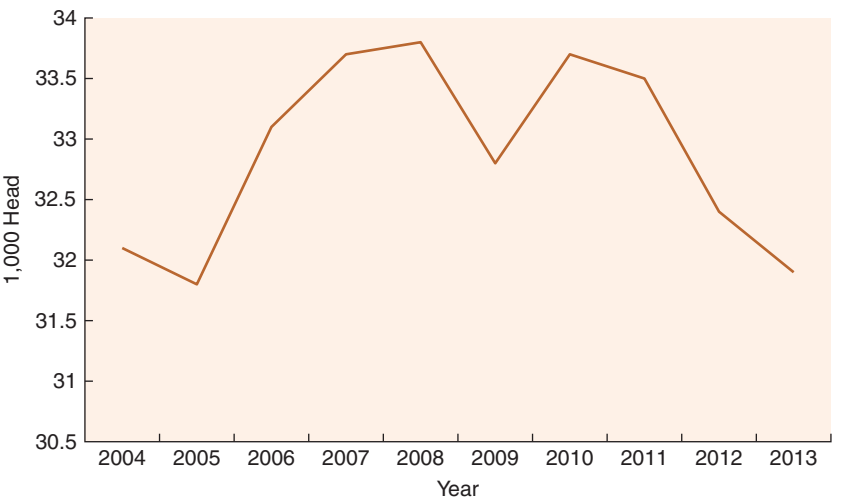


Figure 1.12
Annual cattle harvest, 2004–2013.
Source: Adapted from USDA.

of beef wholesalers. Purveyors buy beef and perform some fabrication, while distributors buy and sell beef without cutting or changing the product. Purveyors sell almost exclusively to the food service industry (which cooks and sells food for away-from-home or take-out consumption). Purveyors are specialized meat processors who provide highly palatable center-of-the-plate products to food service operators, retail stores, and mail order customers.

Purveyors handle about 5% of total beef. The number of distributors and purveyors continues to decline, however; so they are becoming less important as a separate beef industry segment. Packers are increasing their sales directly to retailers or through brokers. Fabrication of beef carcasses continues to increase at the packer level.

The Retail Segment

U.S. food retailing accounts for nearly $638 million in annual sales with approximately 38,000 stores with more than $2 million in per year sales. The grocery business employs 3.4 million people. Supermarkets stock over 42,000 items per store, ring up an average transaction of $30, and are visited by the average customer 1.5 times per week. The top 10 U.S. grocers in this highly competitive industry are listed in Table 1.5.

Historically, almost all retail cuts were prepared at the store level by in-house butchers fabricating sides or quarters of beef. Today most of the beef received by grocery stores is in the form of boxed beef primals, boneless subprimals, or beef for grinding. The movement to case-ready products was an innovative shift that improved the ability of retail stores to order specific cuts best suited to their customer demographics, improved efficiencies by reducing dead air space in refrigerated trucks that once carried hanging carcasses, and improved distribution margins. Sales by meat, poultry, and fish departments comprise approximately 14% of all grocery store sales, with fresh beef accounting for approximately one-third of meat department sales (Table 1.6).

The Consumer Segment

Figure 1.13 illustrates consumer demand by demonstrating per capita expenditures for beef and competitive proteins. Beef consumption has varied over time with significant retail beef consumption growth on a per capita basis from 1960 to 1976. This period of demand expansion was followed by a steady decline into the early 1990s. The primary reasons for the decline were excessive fat production, inconsistency in palatability, price and convenience competitiveness from chicken, and consumer perceptions about the role of beef in a healthy diet.

Table 1.5
Top 10 Grocery Companies in the United States

Company	Annual Sales (bil. $)	Stores (*N*)
Wal-Mart	343.6	5,100
The Kroger Company	103.0	3,700
Costco	79.7	460
Safeway	36.3	1,330
Publix	30.6	1,300
Ahold U.S.A.	25.9	765
H-E-B Grocery	19.8	300
Albertson's	19.5	1,100
Delhaize	17.1	1,360
Meijer	15.7	200

Source: Adapted from multiple sources.

Table 1.6
DISTRIBUTION OF CONSUMER EXPENDITURES AT SUPERMARKETS

Item	Percentage of Sales
Perishables	54
Fresh meat and seafood	14
Produce	11
Dairy	9
Frozen foods	6
Deli (full service and self-serve)	4
Bakery and baked goods	3
Grocery (non-perishable foods)	24
Grocery (non-food items)	6
Other (general merchandise, beauty, etc.)	10

Source: Based on Progressive Grocer, Food Marketing Institute, and the Association of Retailers.

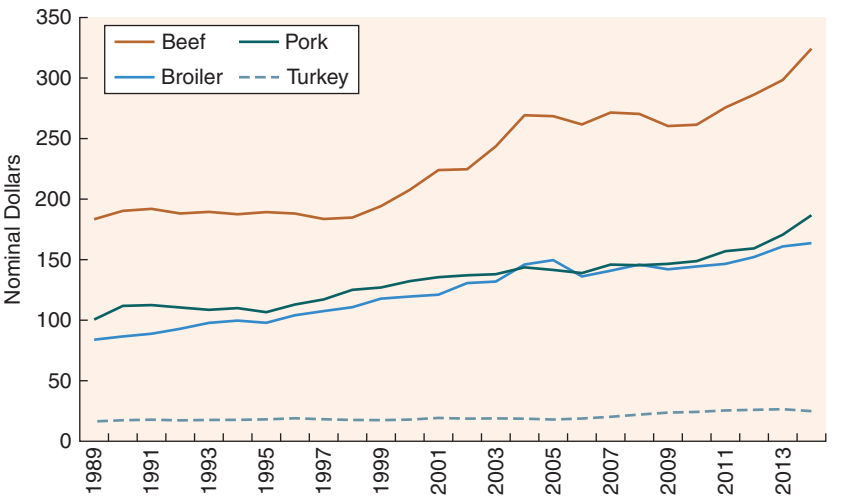


Figure 1.13
Expenditure for meat and poultry, 1989–2014.
Data source: USDA Economic Research Service; analysis and compiled by Livestock Marketing Information Center.

The industry undertook a strategic effort to reverse demand losses with investments in producer education focused on improving beef's attributes, consumer outreach through effective advertising campaigns, investments in food safety enhancements, nutritional studies to evaluate the role of beef in the diet, and a host of other initiatives designed to improve beef's competitiveness. Through these efforts, the industry stabilized demand and began to rebuild market share.

Consumers continue to demand more service and convenience in their food products as their incomes rise or as they have less time to cook, prepare, and eat meals. Time has become a precious commodity as single-parent and two-income families have increased. Time and convenience are reflected in increasing away-from-home meals. Consumers eating at home also want more convenience: they desire products that require minimal preparation time but with a significant amount of choices in regard to flavor. Consumers still want a feeling of having participated in home meal preparation and so "meal kit" and other meal packaging concepts have gained favor in the supermarket. The active lifestyles of consumers have led to supermarkets accounting for 20% of takeout food sales. A more detailed discussion of consumer trends is provided in Chapter 2.

Beef Industry Goals

Given the divergent and unique roles of each sector of the beef supply chain, it is difficult to arrive at a unifying goal for the industry. However, it is clear that the industry and its participants must accomplish several outcomes to assure its viability:

- Provide a source of protein that delivers a satisfying eating experience for its customers.
- Operate enterprises that provide meaningful careers and generate profits.
- Conduct business in such a way that landscapes, natural resources, and communities are enhanced.

The creation of effective management systems, business relationships, and enterprise models is fundamental to long-term success. A more detailed discussion of these topics is provided in Chapter 3.

Profitability

Enterprise profitability trends based on cash costs and returns for cow-calf producers and cattle feeders are shown in Figures 1.14 and 1.15. The net return (income minus cost) has varied dramatically over the years; any one segment might experience a

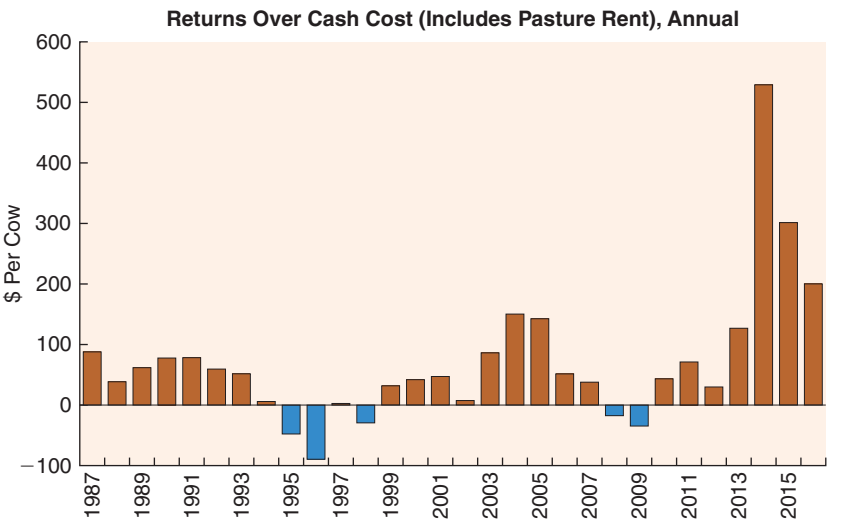


Figure 1.14
Estimated annual average cow-calf returns over cash costs.
Major data sources include: USDA Agricultural Marketing Service (Market News) and National Agricultural Statistics Service; analysis and compiled by Livestock Marketing Information Center.

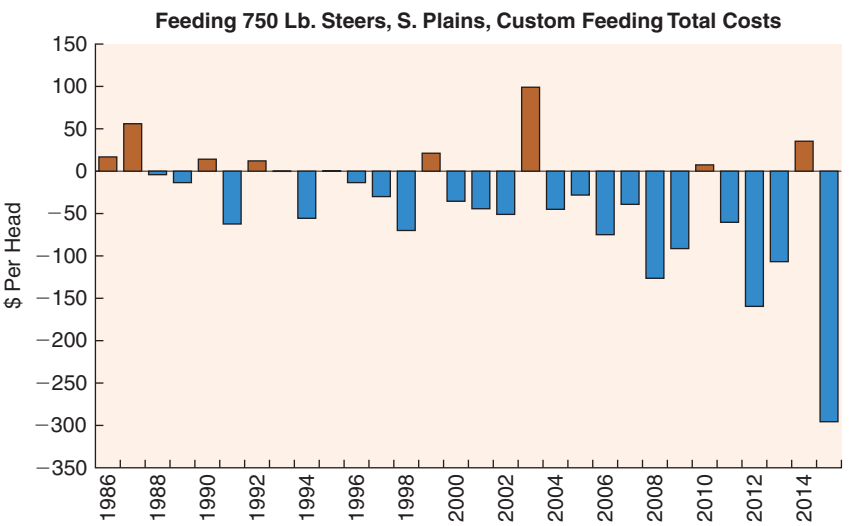


Figure 1.15
Annual average fed cattle profit and loss.
Major data sources include: USDA Agricultural Marketing Service (Market News) and National Agricultural Statistics Service; analysis and compiled by Livestock Marketing Information Center.

$100 per-head loss to more than a $100 per-head profit at a given point in time. These trends explain the need for effective risk management strategies to be employed by industry participants.

During the past several decades, there have been few years in which all segments of the beef industry have made a profit during the same year (Figure 1.16). The late 1980s and early 1990s were profitable years for most segments, but more often profit in one beef industry segment came from a loss in another segment.

There are a number of factors that affect profitability for each sector of the industry. For example, returns for cow-calf producers tend to fluctuate with changes in total cattle inventory (Figure 1.17). The U.S. cattle inventory is responsive to cost of production, profitability of alternative enterprises, and cattle prices. Increases in the cost of production impact herd retention rates and if they rise high enough to make alternative uses of land and resources attractive, then producers will cut production. Per-cow costs over time (Figure 1.18) show that costs were reasonably stable from 1988 to 2000, after which cost trends increased substantially. This increase was largely due to rising costs of feed and fuel. Rising costs coupled with historic levels of profitability in grain production led to a reduction in the U.S. beef herd. In a commodity business,

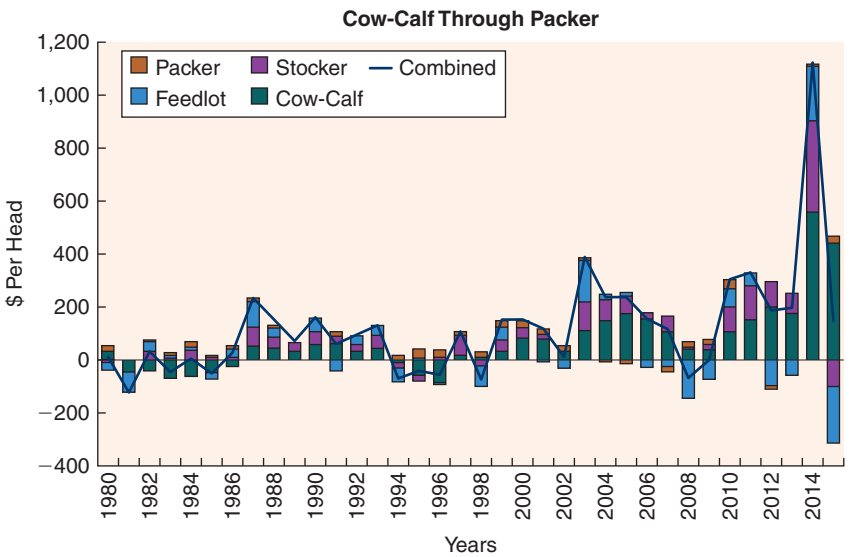


Figure 1.16
Industry profitability.
Source: Cattle-Fax.

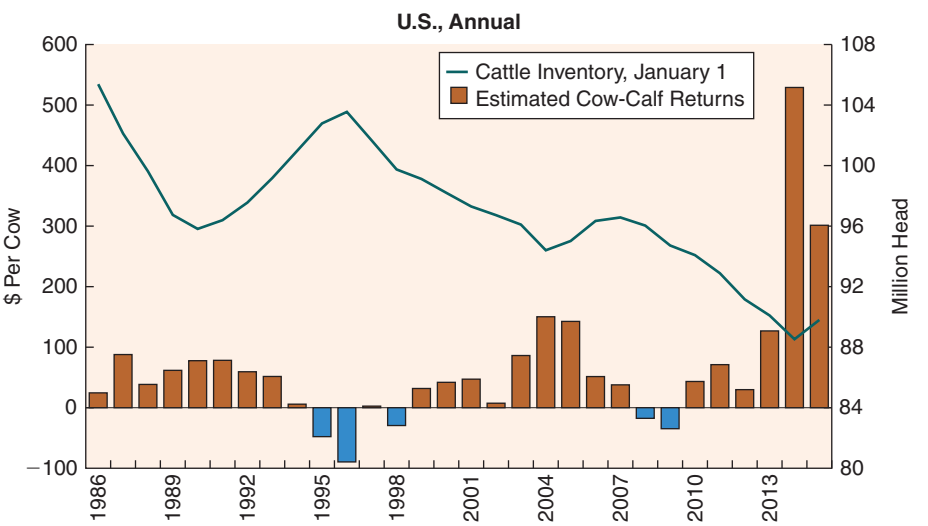


Figure 1.17
Cow-calf returns and cattle inventory.
Major data sources include: USDA Agricultural Marketing Service (Market News) and National Agricultural Statistics Service; analysis and compiled by Livestock Marketing Information Center.

Figure 1.18
Estimated average annual cow costs.
Major data sources include: USDA Agricultural Marketing Service (Market News) and National Agricultural Statistics Service; analysis and compiled by Livestock Marketing Information Center.

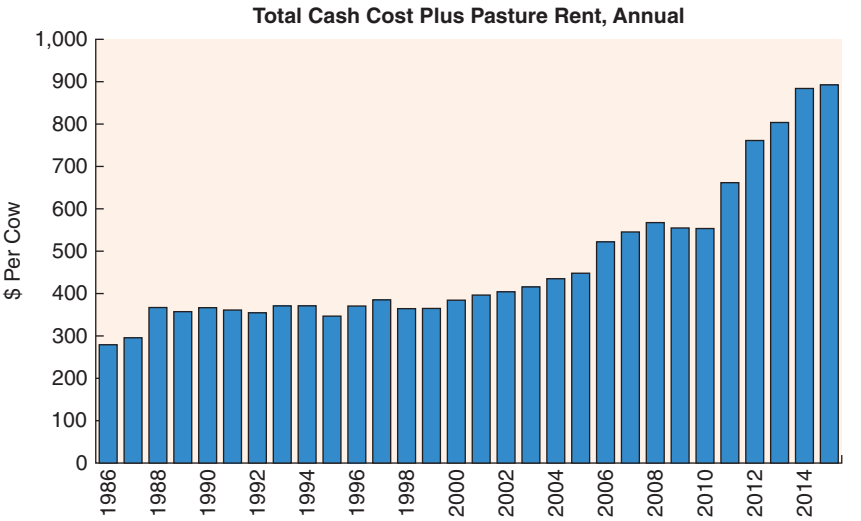
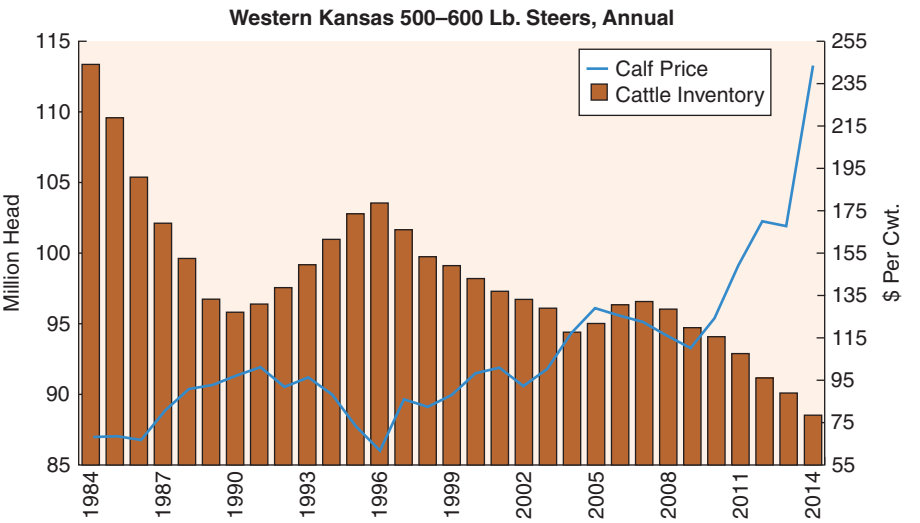


Figure 1.19
Calf prices and cattle inventory.
Data sources: USDA National Agricultural Statistics Service and Agricultural Marketing Service (Market News); compiled by Livestock Marketing Information Center.



the forces of supply and demand will come to bear such that in times of high inventory and thus relatively large beef supplies, the price for cattle declines while in times when inventories are low, prices tend to rise (Figure 1.19). Ultimately, the profitability of the beef industry over the long term is dependent on beef demand and consumption levels (Figure 1.20).

A more detailed analysis of the factors affecting profitability for cow-calf, yearling, and feedlot producers is discussed in Chapters 5, 6, and 7, respectively.

BEEF INDUSTRY ORGANIZATIONS

Industry organizations have been established to allow individual members to pool resources invested to exert policy influence, advocate for the industry, increase market opportunities, educate both internally and externally, conduct professional research studies, collect and disseminate vital information, and to lead the beef business into the future.

It is impossible for the 728,000 beef cattle producers to have individual meaningful influence with consumers, policy makers, supply chain participants, and decision influencers. However, through association in professional trade and professional organizations, progress can be made. One of the challenges confronting the industry is to develop

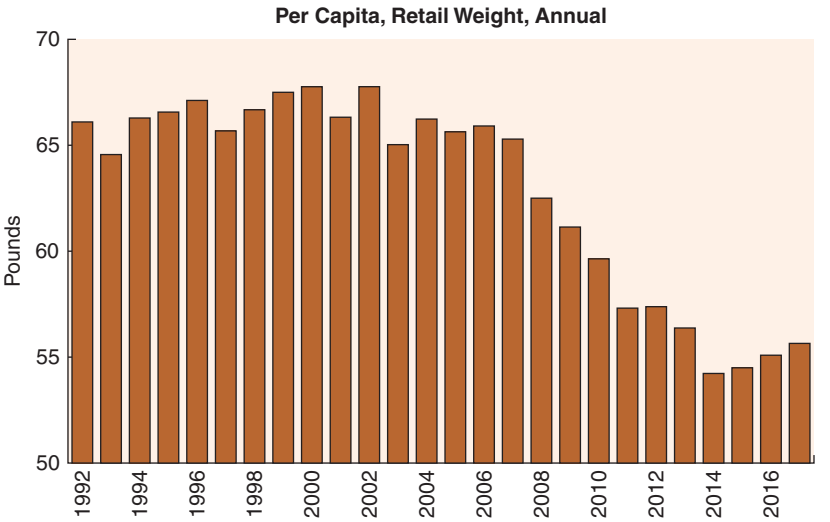


Figure 1.20
Average annual beef consumption.
Data sources: USDA National Agricultural Statistics Service and Economic Research Service; analysis and compiled by Livestock Marketing Information Center.

organizations that unify industry participants and that are effective at attracting membership investments of time, talent, and treasure.

There are many organizations that represent or influence cattle producers. The traditional independent philosophy of cattle producers can serve as a barrier to effective planning and adjustment to change. However, those individuals who align with others to direct change are more likely to find success. The complexity of modern agriculture, world trade, and mounting regulation create an atmosphere conducive to increasing frustration for producers. An unfortunate effect of this frustration is that some producers become angry and allow emotion to control their decision making. When organizations cater to emotion and anger, adoption of self-defeating policies that may seem appropriate in the short term but ultimately lead to a loss of competitive position for the beef industry is likely to emerge.

The future of beef as a product and of the beef industry is directed by group action. The influence of organizations on the beef industry will be determined by (1) the industry's capacity for linking and coordinating the actions of its organizations and for forming alliances with other groups having common interests, and (2) effective organizational leaders who can effectively represent their members.

Cattle producers must work together for the following reasons:

1. The impact of government on the cattle industry will remain great. This is especially true because politicians represent an urban society with less than 2% of the U.S. population directly involved in production agriculture. Government affairs will continue as a major focus of the beef industry and its representative organizations.
2. To make beef more competitive with other meats, the industry must guide, encourage, and support research and development efforts in production technology and product development and marketing.
3. Cattle producers need a source of information to help them make sound management decisions along with effective educational and training programs for themselves and their employees.
4. The industry needs an effective beef marketing program that includes consumer and market research, product development, product information, promotion, and merchandising. In addition to improving the efficiency of beef production and distribution, the industry needs to support programs that will stabilize or improve beef acceptance.
5. Public information efforts should be expanded to improve public and government acceptance and understanding of beef economics, production, and marketing methods.

Eventually, there may be a unified beef industry organization formed at both state and national levels. Meanwhile, though, beef industry programs should be coordinated to effectively utilize the funding now provided by individual cattle producers to several agricultural organizations.

The major organizations representing individuals or companies within each beef industry segment, and other organizations having an effect on each segment, are shown in Table 1.7. The major organizations involved with the marketing process that moves animals or products from one segment to another are also shown in Table 1.7. Additional organizations that affect the beef industry are noted in the Appendix. Each participant in the beef industry should participate in those organizations that affect its business activities.

The power of a unified effort in the industry is demonstrated in the effectiveness of the National Cattlemen's Beef Association (NCBA) current long-range plan (Table 1.8). The first plan enacted in 1997 laid out aggressive goals to increase beef demand and enhance profitability as a result. The phenomenal growth in demand can largely be attributed to the determined effort of each industry segment toward attainment of the goals and objectives of the long-range plan. Modifications have continued to be made to allow the industry to proactively direct resources to the areas of greatest need and impact.

Table 1.7
MAJOR ORGANIZATIONS REPRESENTING OR AFFECTING THE BEEF INDUSTRY[1]

Segments	Major Organizations Influencing Each Segment	Other Organizations Directly Affecting Each Segment[2]
Seedstock producers	American National Cattlewomen Beef Improvement Federation Breed Associations National Cattlemen's Beef Association State Beef Councils State Cattlemen's Associations U.S. Beef Breeds Council	(1) State Department of Agriculture (2) USDA Animal and Plant Health Inspection Service[3] (3) USDA Packers and Stockyards Administration (4) American Association of Bovine Practitioners (5) Occupational Safety and Health Administration
Commercial cow-calf producers	American Farm Bureau American National Cattlewomen Beef Improvement Federation Breed Associations Cattle-Fax County Livestock Growers organizations National Cattlemen's Beef Association National Grange State Beef Councils State Cattlemen's Association	(6) Environmental Protection Agency (7) American Society of Animal Science (8) USDA-Forest Service (9) USDA-Soil Conservation Service (10) USDA-Agricultural Research Service (11) USDA-Extension Service (12) USDA-Statistical Reporting Service (13) Society for Range Management (14) American Registry of Professional Animal Scientists (15) Livestock Publications Council (16) International Embryo Transfer Society (17) Beef AI organizations and National Association of Animal Breeders (18) Animal Rights Organizations and environmental groups
Feeders	American Farm Bureau American National Cattlewomen Cattle-Fax National Cattlemen's Beef Association State Beef Councils State Cattle Feeder's Association	(1), (2), (3), (4), (5), (6), (10), (11), (12), (14), (15), (18)[4] (19) American Feed Manufacturers Association (20) National Feed Ingredient Association (21) Food and Drug Administration (22) USDA Office of Transportation (23) Animal Health Institute

Table 1.7 (Continued) MAJOR ORGANIZATIONS REPRESENTING OR AFFECTING THE BEEF INDUSTRY[1]

Segments	Major Organizations Influencing Each Segment	Other Organizations Directly Affecting Each Segment[2]
Packers and processors	American Association of Meat Processors American Meat Institute American Meat Science Association Institute of Food Technologists National Cattlemen's Beef Association National Food Processors Association National Meat Canners Association State Beef Councils State Meat Dealers Association	(1), (2), (3), (4), (5), (6), (12), (14), (15), (18), (21), (22) (24) Federal Trade Commission (25) Labor Unions (26) National Perishable Transport Association (27) USDA Food Safety and Inspection Service (28) USDA Agricultural Marketing Service
Meat retailers/ food service organizations	American Association of Meat Processors American Institute of Food Distributors National Association of Meat Purveyors National Association of Retail Grocers of the United States National Frozen Food Association National Restaurant Association State Meat Dealers Association State Restaurant Association	(1), (2), (3), (5), (6), (18), (21), (22), (24), (25), (26), (27), (28) (29) Food and Drug Law Institute (30) USDA-Food and Nutrition Service (31) Joint Labor Management Commission of the Retail Food Industry (32) National Restaurant Association (33) Food Service and Lodging Institute
Marketing points between segments	American Stockyards Association Cattle-Fax National Auctioneers Association National Cattlemen's Beef Association National Livestock Grading and Marketing Association National Livestock Producers Association U.S. Meat Export Federation	(12), (18), (21), (22), (24) (37) Agriculture Trade Council (38) USDA-Economic Management Staff (39) USDA-Marketing and Inspection Management (40) USDA-World Agricultural Outlook Board (41) USDA-Animal Air Transport Association

[1] Addresses and descriptions of these and other organizations are provided in the Appendix.
[2] Organizations (1) through (18) are applicable to both seedstock and commercial cow-calf segments.
[3] USDA organizations can be accessed through www.usda.gov.
[4] Repeated numbers refer to the same organizations identified earlier in the table.

Table 1.8
NCBA LONG-RANGE PLAN ELEMENTS

Industry Mission:
"a beef community dedicated to growing beef demand by producing and marketing the safest, healthiest, most delicious beef that satisfies the desires of an increasing global population while responsibly managing our livestock and natural resources."

Industry Vision:
"To responsibly produce the most trusted and preferred protein in the world."

Primary Performance Metric:
"increase the wholesale beef demand index by 2 percent annually over the next five years."

Four core strategies required to attain vision:
- Drive growth in beef exports.
- Protect and enhance the business and political climate for beef.
- Grow consumer trust in beef and beef production.
- Promote and strengthen beef's value proposition.

Source: Adapted from NCBA Long-Range Plan.

National Cattlemen's Beef Association (www.beef.org; www.beefusa.org). The NCBA, with headquarters in Washington, DC, and Denver, is the national spokesperson for all segments of the nation's beef cattle industry, including cattle breeders, producers, and feeders. The nonprofit trade association was originally formed in 1898. In 1996, the National Cattlemen's Association and the National Live Stock and Meat Board merged to create the NCBA. The NCBA represents approximately 175,000 cattle professionals throughout the country via individual memberships and through membership in the state and breed affiliates aligned with NCBA. Membership includes 28,000 individual members, 46 affiliated state cattle associations, and 27 affiliated national breed organizations. NCBA programs are financed by funds contributed by individual members and affiliated associations.

The NCBA provides services cattle producers cannot perform satisfactorily as individuals. Pursuant to this goal, the NCBA performs three basic functions: (1) primarily through its Washington, DC, office, it represents the beef cattle industry in the legislative and administrative branches of the federal government; (2) it interprets beef production and beef economics for the public and economic, social, and political developments for the industry; and (3) it provides information to aid members in planning and management decisions.

American National Cattlewomen (ANCW) (www.ancw.org). The ANCW is a group established for participation in the promotion, education, and legislation of beef.

U.S. Meat Export Federation (USMEF) (www.usmef.org). The USMEF is a nonprofit trade association that works with the U.S. meat and livestock industry to identify and develop overseas markets for U.S. beef, veal, pork, lamb, and variety meats. It is based in Denver, with overseas market development offices in Beijing, Beirut, Brussels, Cairo, Hong Kong, Lima, Mexico City, Monterey, Moscow, Saint Petersburg, Seoul, Shanghai, Singapore, Taipei, and Tokyo. USMEF also has representation in the Caribbean. Through these offices, the MEF coordinates market development programs. Its programs are designed to identify new markets, create widespread product awareness, secure fair market access, provide trade servicing, and assist and educate overseas buyers and U.S. suppliers alike. Established in 1976, the MEF is a cooperator with the Foreign Agricultural Service (FAS) of the U.S. Department of Agriculture. It represents livestock producers and feeders, meat packers, purveyors and exporters, agribusiness and agriservice interests, farm organizations, and grain promotional groups. The MEF has several sources of funding: its members, overseas private sector interests, beef checkoff money, and the Foreign Agricultural Service.

State Beef Councils. Most states have a beef council that is funded with checkoff dollars. Their primary objective is to educate consumers about the nutritional aspects of beef and how to best select and prepare beef. The councils communicate with health professionals and food service industry personnel and work to promote beef to consumers.

North American Meat Institute (NAMI) (www.meatinstitute.org). The NAMI was created in 2015 through the merger of the American Meat Institute and the North American Meat Association to represent meat packers and processors who produce more than 95% of the red meat in the United States as well as suppliers of meat equipment, products, and services. Activities include marketing, research, congressional and legislative relationships, improved operating methods and products, conservation, spoilage prevention, and industrial education.

American Association of Meat Processors Association (AAMP) (www.aamp.com). AAMP is an international trade association composed of meat processing companies and associations that provide the finest center-of-the-plate products and service to food service, retail stores, and mail order customers. AAMP is also the publisher of the world-renowned publication *The Meat Buyer's Guide*.

Food Marketing Institute (FMI) (www.fmi.org). Domestic and international food retailers and wholesalers are members of the FMI, which maintains a liaison with both the government and consumers. FMI conducts programs in research, education, industry relations, and public affairs.

BEEF INDUSTRY ISSUES

The beef industry has faced numerous issues during past years. Some of these issues are addressed here; others are covered in later chapters. Issues facing the beef industry change frequently, sometimes daily.

The U.S. population continues to increase, but Americans actively involved in agricultural production represent less than 2% of the total population. This disparity in numbers reflects the communication problems between urban populations and agricultural producers. One of the significant outcomes of the shift from a rural employment pool to an urbanized economy has been the difficulty in maintaining a representative voice for agriculture in state and national policy making. Most Americans are now at least one, if not several, generations removed from the farm and ranch and as such have less connection to and understanding of the food production system. Perceptions and personal beliefs get confused with true relationships. The lack of communication between agriculture and the rest of society is rooted in a media culture that favors sensationalism, a national population that prefers to be entertained rather than enlightened, and an agricultural industry that has too frequently responded to issues in a defensive or reactive manner.

Cattle producers need an organizational structure like the National Cattlemen's Beef Association to manage issues of national and international scope. Such an organization can objectively project a positive industry image by (1) coordinating a proactive approach to issues affecting the industry; (2) developing sound technical information to be used by industry leaders; (3) encouraging producers to implement responsible production practices; (4) conducting research among consumers and industry influencers to understand their needs and opinions; and (5) providing credible information to opinion influencers. It is important that the issues facing the beef industry be addressed before they reach a crisis stage.

No better example of this can be given than the management of the single case of "mad cow disease" diagnosed in an imported dairy cow in the state of Washington and reported on December 23, 2003. In what could have been an economic disaster for the beef industry and related businesses, a rational, science-based response by NCBA, USDA, industry leaders, and health professionals filled the void with facts rather than speculation, reason instead of hysteria, and openness rather than misinformation.

The incident resulted in the loss of most exports of U.S. beef, a myriad of new regulations, and increased pressure to develop a national animal identification system to facilitate traceback. However, the NCBA management plan largely helped to maintain consumer confidence in the midst of the crisis.

Environmental Issues

The American public is generally not familiar with the economics of the food production chain. Most people, however, are concerned with the use and preservation of

natural resources. There are influential consumer, nutrition/health, and environmental groups with multimillion dollar budgets that focus on these issues.

Cattle have the unique ability to graze untillable acres and convert plants that humans cannot eat into highly palatable human food. However, while some people know that cattle can effectively use the land, others feel that cattle abuse the land. Cattle producers that implement proper grazing practices prevent overgrazing along streams and rivers (riparian areas). Their grazing management also fosters compatible relationships between livestock and wildlife. The issues of grazing fees on public lands, wetlands, and inferences that overgrazing is the major cause of rangeland desertification are discussed in Chapter 15. Other specific environmental issues will be discussed in Chapters 5 and 7.

ANIMAL WELL-BEING

Beef producers have been concerned with the use and welfare of their animals for centuries. Animals were domesticated to give nomadic people a consistent supply of food and companionship. Draft animals were domesticated for transportation and power. People soon learned that the productive response of animals is greater when they are given proper care.

Today, the nutrition, health, and management needs of farm animals are well known and scientifically based. Evidence suggests that many domesticated animals in the United States receive a more nutritious diet than some humans consume. The veterinary medical profession provides on-farm services, health clinics, and hospital care that are in many ways equal to human health-care services. The members of the NCBA adopted a statement of principles that affirms that cattlemen are united in their philosophy that proper and humane care of the animals they are responsible for is a moral obligation as well as an economic necessity. The tenets of this statement of principle follow:

- I believe in the humane treatment of farm animals and in continued stewardship of all natural resources.
- I believe my cattle will be healthier and more productive when good husbandry practices are used.
- I believe that my and future generations will benefit from my ability to sustain and conserve natural resources.
- I will support research efforts directed toward more efficient production of a wholesome food supply.
- I believe it is my responsibility to produce a safe and wholesome product.
- I believe it is the purpose of food animals to serve mankind, and it is the responsibility of all human beings to care for animals in their charge.

Proactive approaches to assure that cattle are handled, managed, transported, marketed, and harvested humanely are provided throughout the following chapters.

Diet Health and Food Safety Issues

Consumers have become increasingly more aware of diet and health and the nutritional and safety aspects of food. These issues are discussed in Chapter 2.

Marketing Issues

A major challenge for the beef industry is to generate and maintain high-quality products. This is extremely difficult in a segmented industry where cattle and products are not well identified as they move from one segment to another segment.

Quality is an ambiguous word that must be more clearly defined if it is to be effectively communicated and achieved. The production and market specifications presented in Chapter 4 (Table 4.5) are a starting place in putting numerical values on traits that can be used to identify quality. Consumers' definition of quality eventually goes beyond the color of lean meat and the amount of marbling to include products that are reasonably priced, safe, nutritious, consistent, and healthful, and that are consistently high in palatability.

Quality is best defined with Total Quality Management (TQM), which is "meeting or exceeding your customers' expectations at a cost that represents value to them every time."

Following are some of the major marketing issues related to marketing slaughter cattle:

1. The 2011 Beef Quality audit estimated that $43 per slaughter steer/heifer was lost to the industry because of quality shortfalls. These per-head losses were from waste fat and cutability issues ($6); palatability, such as tenderness and marbling ($25); offal and hide defects ($6); and excessive carcass weights ($7). To remain competitive with other meats and food products, the beef industry will need to address these costs of production and quality assurance needs.
2. Surveys show that 20% of the cuts from the loin and rib and 60% of retail cuts from the round have unacceptable tenderness problems. Because marbling accounts for only 10–20% of the tenderness differences in beef, quality assurance for tenderness and overall palatability must be addressed more directly. The most frequent consumer complaints of inconsistencies of tenderness and juiciness cannot be ignored without having an effect on the entire beef industry. Investments in research that addresses these issues are critical to the future of the business.
3. A comprehensive beef quality assurance program is needed so that processors, retailers, and consumers can have confidence in the product quality of both cattle and carcasses. Cattle producers need to control their health programs in order to maintain consumer confidence that animal drug and medication procedures are well managed. The creation of supply chain trust depends on an effective program focused on the development and implementation of quality standards and best practices across the various sectors.

The beef industry needs to cooperate to consistently supply high-quality products. The ultimate goal of quality assurance for producers, processors, and retailers is to assure consumers that they are receiving beef products that are safe, healthful, and highly palatable.

SELECTED REFERENCES

Publications

Agricultural census. 2012. Washington, DC: USDA National Agricultural Statistics Service.

Annual agricultural statistics. 2014. Washington, DC: USDA National Agricultural Statistics Service.

Directions. 2015. Englewood, CO: National Cattlemen's Beef Association. 18:3, pp. 33–43.

Livestock and poultry situation and outlook report. Washington, DC: USDA.