

Cattle cycles in perspective

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Cattle cycles are measured from one cyclical low in inventory numbers to the next. The physiological requirements of cattle production give cycles considerable consistency. But because of economic factors—and other factors, such as changes in tastes and technology—cycles also vary considerably.

The last cycle was different in several respects. It started in 1967 and was the longest since the 16-year cycle that ended in 1928. The cyclical downturn, which began in 1975, has been the sharpest on record.

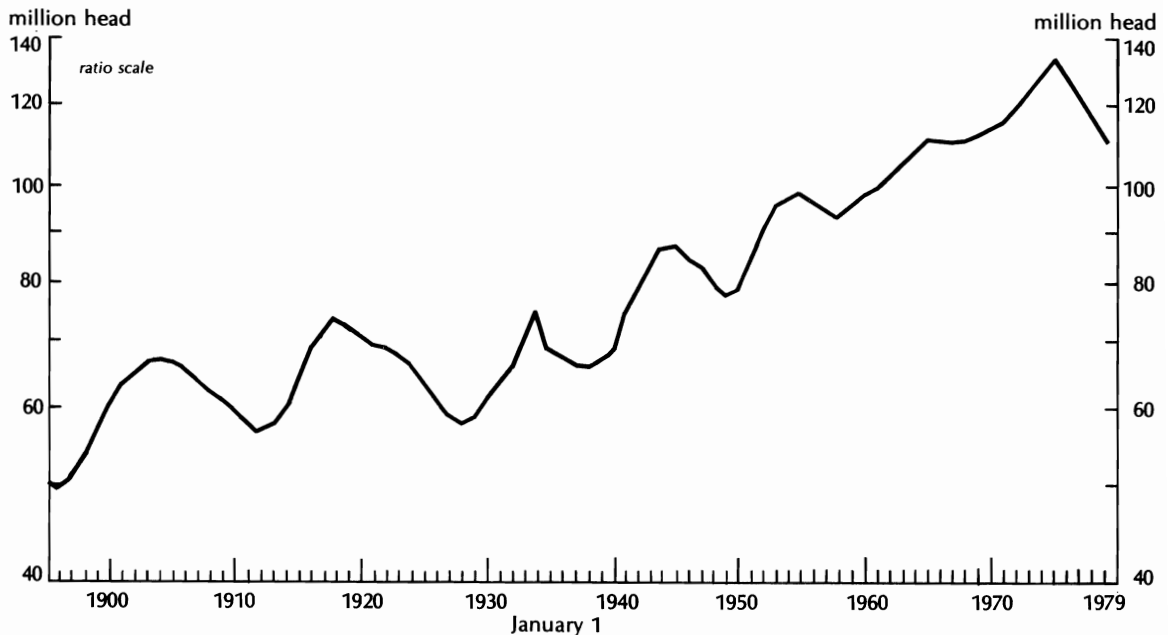
This unparalleled contraction underlies the past two years of decline in beef production. And even though cattle numbers now appear to be rising, a study of previous cycles shows beef production could be down for another year or two.

Cycles since 1896

Estimates of the January 1 inventory of all cattle—including calves—are available back to 1867. Cattle numbers doubled between 1867 and 1890 and then declined nearly a fifth over the next six years. Since there is no data to mark the beginning of that cycle, however, the first fully measurable cattle cycle starts from the low reached in 1896.

There have since been seven cycles. They have averaged 12 years in duration, encompassing seven years of expansion and five years of contraction. During expansion phases, cattle numbers have risen an average of 28 percent. During contractions, numbers have declined an average of 12 percent. When the recent cycle began in 1967, the cat-

In the past four years cattle numbers declined faster than in any previous cycle



tle inventory was about 109 million head. By 1975, the number had climbed to 132 million, an increase of about 21 percent. By the beginning of 1979, however, the inventory had declined 16 percent from the peak to less than 111 million head.

Nature of cattle cycles

Most livestock and poultry commodities have a production cycle. But, because of physiological differences, cattle cycles are the longest.

Cows ordinarily produce only one calf a year. Gestation takes nine months and twins are rare. By contrast, a sow produces 16 to 20 offspring a year. This reflects at least two pregnancies, each lasting less than four months, plus multiple births, and the increasing practice of farrowing pigs in confinement to protect them from the weather. A hen serves in the hatchery supply flock about ten months of a year, producing around 150 eggs. The eggs hatch after three weeks in an incubator.

It also takes longer to raise a calf to a mature age for breeding or slaughter. A heifer produces its first calf at two years of age. The lag from birth to first offspring is ten months for a gilt and six months for a hen.

Raising a calf to slaughter weight requires about 18 months, including five to eight months in a feedlot. A pig is ready for market in six months, a chicken in less than two.

In addition to physiological factors, there are also economic forces that govern cattle cycles. These forces are initiated at the retail meat counter, where beef is priced relative to consumer demand and the availability of other meats. Beef prices high enough to make live cattle profitable encourage production, and vice versa.

Feedlot operators—who feed cattle high protein diets designed to produce high quality carcasses—are the first to react to beef prices. As prices change they adjust the number of feeder cattle brought into the feedlots. In turn, the number of cattle moving through feedlots affect cow-calf operators, who control the cattle breeding stock and

supply feeder cattle to feedlots.

Except for the few that die otherwise, all calves are eventually slaughtered for meat. However, there are differences governed by economic considerations in when they are slaughtered. A calf can be killed for veal. Or it can be raised to spend some time in the breeding herd. Or it can be raised specifically for slaughter, either on grass or in feedlots. The choices of feedlot operators directly or indirectly affect the number of head that move through each channel, with the result that decisions of these operators have important short-run implications for beef supplies. But longer-term shifts in beef production are more closely tied to the decisions of cow-calf operators. The decisions of cow-calf operators, although not unrelated to the actions of feedlot operators, largely determine the momentum and the turning points in cattle cycles.

The economic conditions during the two or three years around the low of a cattle cycle reflect tightening supplies and rising prices of beef. But high beef prices also boost prices for fed cattle, in turn, strengthening demand for feeder cattle. Incentives to slaughter calves for veal are lessened. And opportunities are increased for building breeding herds and raising calves that will meet the growing demand of feedlot operators.

Breeding herds can be rebuilt only through less culling and more diversion of heifers from slaughter to breeding herds. Rebuilding herds temporarily aggravates the already short supply of beef. But over a period of three or four years, stronger markets provide the basis for increased beef production.

As herds are rebuilt and the increase in offspring eventually moves into slaughter channels, the supply of beef comes into better balance with demand. Because of the long physiological delay required to increase cattle production, it is hard for producers to anticipate the timing of equilibrium conditions. Decisions that accommodated the catchup in beef supplies cannot usually be changed fast enough to keep the balance from tipping to excess supply. The results are low fat-cattle prices (relative to production

costs) and reduced demand for feeder cattle.

As cow-calf operators begin losing money, they start liquidating their herds. And that, in turn, swells beef supplies for a while, further depressing cattle prices and aggravating the loss situation already plaguing cattlemen. Not until the herd has been reduced to the point that beef supplies turn short, again triggering profits, do cow-calf operators begin rebuilding their herds.

This economic scenario is, of course, generalized. But it shows the nature of the problem. Because of the time required to produce cattle, equilibrium between the demand for beef and the supply of cattle is hard to maintain. And because decisions of cow-calf operators to cull or rebuild their breeding herds exaggerate fundamental conditions of the beef market, year-to-year changes in beef production do not always coincide with the trend in cattle numbers.

Changing tastes and technology

In addition to physiological and economical factors, changing tastes and technology also affect cattle cycles. The rapid spread of feedlots after the 1940s brought a major change in the way cattle are raised. Supported by abundant supplies of feed grains, feedlots provided a quick, efficient way of converting beef on the hoof to hanging carcasses. As feedlot capacity expanded in the 1950s and 1960s, there was a marked up-trend in the production of beef.

Meanwhile, as eating away from home became more popular after the 1940s, the old preference for grain-fed beef over grass-fed beef was reinforced by the availability of better cuts of beef that had been fattened in increasingly efficient feedlots.

The changing composition of the cow herd has also affected cattle cycles. The cow herd is made up of dairy animals and beef animals. Each is a distinct element of the herd, but because both produce meat, they are closely related.

The composition of the herd has been shifting since the Depression. Two out of three cows in the 1930s were dairy cows. The

number of dairy cows peaked, however, in the mid-1940s at 28 million and has since trended steadily downward. Growth in total cow numbers since has been entirely in beef animals. When the number of all cows peaked last in 1975, at 57 million head, four out of five were beef cows.

Effects of this continuing shift in the cow herd have affected cattle cycles from both the production and consumption side. Dairy cows accounted for a disproportionately large share of the overall cow herd liquidations that accompanied the cyclical downturns in the 1940s, 1950s, and the 1960s. But in the downturn of the 1970s, beef cows declined relatively more than dairy cows.

Where the 1950s and 1960s were marked by growth in demand for fed beef, the 1970s were marked by growth in demand for convenience foods and lean beef—the type usually obtained from imports and from cows and grass-fed cattle. This shift was accommodated by the rise in fast-food chains and probably extended the liquidation phase in the last cycle longer than would have otherwise been the case.

Comparisons of past cycles

For all their similarities, cycles have varied considerably in both their expansion and contraction phases. Expansion phases of the seven cycles that can be studied have lasted from six to eight years. The relative expansion, however, has varied widely, as has the rate of expansion.

In the past two cycles (1958-67 and 1967-79) the expansion from trough to peak has been roughly 20 percent. In the previous five cycles, the relative expansion varied from 26 percent to 36 percent.

Not only was growth in the past two cycles less, but the rate of increase was also slower. In both the last two cycles, the compound annual rate of increase in cattle numbers was about 2.5 percent. In previous cycles, the rate ranged from 3.8 percent to 4.6 percent.

Despite the relatively small increase in cattle numbers during the expansion phase of

Selected characteristics of
past cattle cycles

Cycle*	Expansion phase			Contraction phase		
	Length in years	Percent increase		Length in years	Percent decline	
		Total	Annual rate		Total	Annual rate
1896-1912	8	35.0	3.8	8	-16.2	-2.2
1912-28	6	31.2	4.6	10	-21.5	-2.4
1928-38	6	29.7	4.4	4	-12.3	-3.2
1938-49	7	31.1	3.9	4	-10.2	-2.7
1949-58	6	25.7	3.9	3	- 5.6	-1.9
1958-67	7	19.5	2.6	2	- 0.2	-0.1
1967-79	8	21.4	2.5	4	-16.0	-4.3

*The cycles extend from one cyclical low point in inventory numbers to the next. The inventories are determined as of January 1.

the last cycle, the growth that did occur was from a base that had been virtually unaffected by the nominal contraction that ended the previous cycle. As a result, when the inventory peaked in 1975, cattle numbers were abnormally high compared with previous peaks, causing some concern about the financial implications of an overbuilt inventory.

Cycles have varied more in the contraction phases than in the expansion phase. Up until this last cycle, contractions have lasted two to ten years. The declines in inventory numbers had ranged from as little as 0.2 percent in the downturn of the 1960s to 21.5 percent in the downturn of the 1920s. The compound annual rate of decline has ranged from 0.1 percent (in the 1960s) to 3.2 percent (in the 1930s). The contraction phase of the last cycle lasted four years, producing a relative decline of 16 percent and a compound annual rate of decline of 4.3 percent.¹ The relative decline has been the largest since the 1912-28 cycle. And the rate of decline has been by far the sharpest for any downturn.

¹It is not yet clear whether 1979 will mark the fifth year of contraction in the last cycle or the first year of expansion in the next cycle. But for all practical purposes, it would appear that cattle numbers have bottomed out. Deletions from the cattle inventory this year (through slaughter and death losses) will probably about match inventory additions (through the 1979 calf crop and net imports). Hence, the January 1, 1980, inventory estimates will probably be virtually the same as at the beginning of this year or perhaps slightly higher. If lower, but only by a negligible amount, the compound annual rate of decline over the five-year contraction phase of the cycle would still be 3.5 percent.

Extent of the recent downturn

Several factors contributed to the sharpness of the recent downturn. Major factors, however, were drought and disruption in the long-term growth of commercial feedlots in the first half of the 1970s.

The number of cattle in feedlots, based on January 1 inventories, rose almost without interruption after the Korean War, increasing 70 percent in both the 1950s and the 1960s. The pace of that buildup helped reduce the effects of the contraction phases of the 1949-58 and 1958-67 cycles by sustaining a growing demand for feeder cattle. This growth in demand short-circuited much of the cyclical rise in cow and heifer slaughter that usually accompanies downturns in cattle numbers.

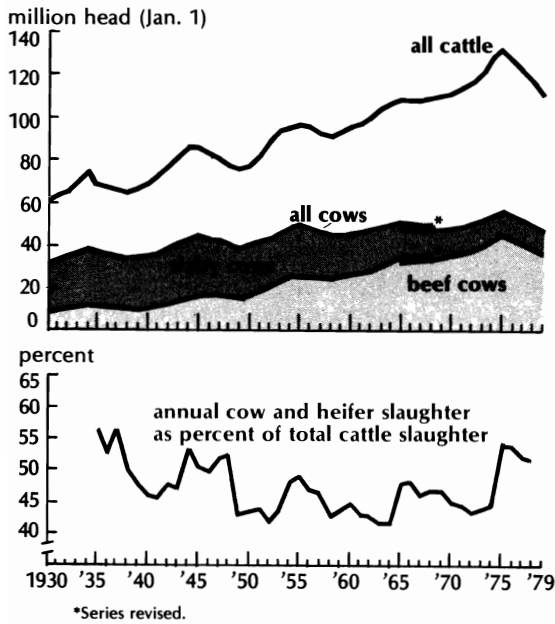
Feedlot inventories continued to rise in the early 1970s, peaking in 1973 at 14.4 million head. Over the next two years, however, the number of cattle on feed plunged 30 percent to a ten-year low. And although inventories later moved higher, the 13.3 million head in feedlots at the beginning of 1979 was about the same as at the beginning of the decade.

Interruption of commercial feeding has made the recent contraction more intense than downturns in the 1950s and 1960s. With the sharper drop in demand for feeder cattle, losses spread quickly to cow-calf operators, who responded by liquidating their herds and cutting back on heifers held for breeding.

On top of that, pastures suffered in the drought of the mid-1970s and forage became less available, boosting the costs of feeding and keeping cow herds. Cow and heifer slaughter rose sharply, accounting for 52.5 percent of the annual cattle slaughter since 1974. That is the highest proportion since the downturn from 1934 to 1938, and compares with averages of about 47 percent during the liquidation phases of the 1949-58 and 1958-67 cycles.

Several factors combined to disrupt commercial feedlot activity in the 1970s. Imposition of controls on meat prices in the spring of 1973—and announcement that summer that controls would soon be lifted—generated expectations of higher prices once controls

Beef cows accounted for a large share of cow herd liquidation in the 1970s downturn



were removed. Producers responded by delaying their marketings. And consumers responded—despite a publicized “beef boycott”—by stockpiling beef.

When controls were removed, cattle markets were quickly glutted. Large marketings put downward pressure on cattle prices, and the pressure was reinforced by a lackluster demand for beef as consumers ate into their hoards. This, coupled with rising feed prices that came with suddenly much larger grain exports, brought losses to feedlot operators.

These losses were compounded the next summer when the rise in feed costs was further escalated by weather problems that sharply reduced supplies of feed. The movement of cattle into feedlots slowed even more, extending losses to cow-calf operators. And about the same time, the general economy turned down, bringing a further curtailment in consumer demand for beef that stretched on into 1977.

These developments coincided with the approaching peak in cattle numbers. Liquida-

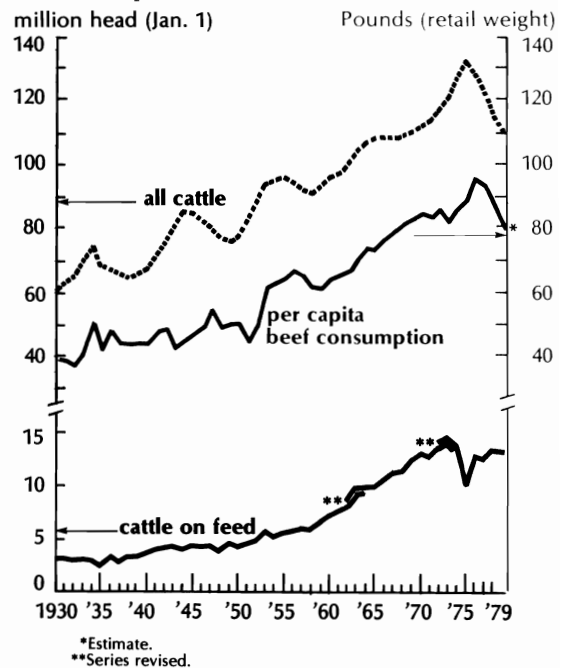
tion of the cow herds, evident in late 1974, became intense in 1975 and continued high throughout much of 1978. As a result, annual cattle and calf slaughter for 1975-77 averaged 22 percent above the average for the first half of the decade.

Beef supplies were swelled for a while. But the liquidation led to an over correction that produced the first evidence of shortages in 1978 and prospects that supplies could remain tight for another year or two. Per capita beef consumption has swung wide. From a peak of 95.7 pounds (retail weight) in 1976—13 percent above the annual average for the first half of the decade—per capita beef consumption will probably decline to 79 pounds in 1979. That will be the lowest level of beef consumption in a decade.

The extent of contraction is striking in several respects.

- The inventory of all cattle is down 16 percent—and so is the inventory of cows. This is the biggest decline in any contraction since

Interruption in the growth of feedlot activity contributed to the sharp downturn in the 1970s



the one that ended the 1912-28 cattle cycle.

- The number of beef cows is down 19 percent—the largest drop since the contraction of the 1934-39 cycle, when the number fell 21 percent.

- Last year's calf crop, at 43.8 million head, was 14 percent less than the 1974 record and the smallest crop in 11 years. In the four previous cycles, the decline in the annual crop ranged from 1 percent to 10.6 percent. And with fewer cows now, this year's crop could be down another million head, possibly marking a 16-year low.

The extent of the contraction points, of course, to the possibility that the worst of it could be behind us. Recent evidence suggests that the contraction phase has ended. In the fourth quarter last year, for example, cow slaughter was down 27 percent from the same period a year earlier. In the first quarter, this year, the margin widened to 33 percent. This was the smallest first-quarter slaughter since 1972.

These changes come too late, however, to offer any hope of increasing beef supplies before 1982.