

## Managing for Today's Cattle Market and Beyond

# *THE CATTLE CYCLE*

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Cycles are a well known and often discussed feature of the cattle business. Improved knowledge of the cattle inventory cycle can be helpful for long-run planning as you evaluate the direction your business should take in the future. This fact sheet discusses the cyclical aspects of the cattle business, some of the causes of cyclical behavior, and several indicators which can be used to monitor the cycle and provide some guidance when making long range plans.

### *Seasonality, Trends and Cycles*

Three time dimensions are usually used when discussing the beef cattle industry; seasonal patterns, trends, and cycles. A seasonal pattern is a regularly repeating pattern that is completed once every twelve months. Examples include seasonal highs and lows in fed cattle or feeder cattle prices which tend to occur near the same time each year. Trends may be thought of as long term direction and an analysis of trends usually covers several years. A long term increase in the U.S. population is an example of a trend. Finally, a cycle is a pattern that repeats itself regularly over a period of years.

The history of the cattle business has been one of cycles as cow-calf producers expand inventories in response to profits and, ultimately, contract their herd size in response to losses. While no two cattle inventory cycles have been exactly the same, there are a number of repetitive patterns that occur across cycles

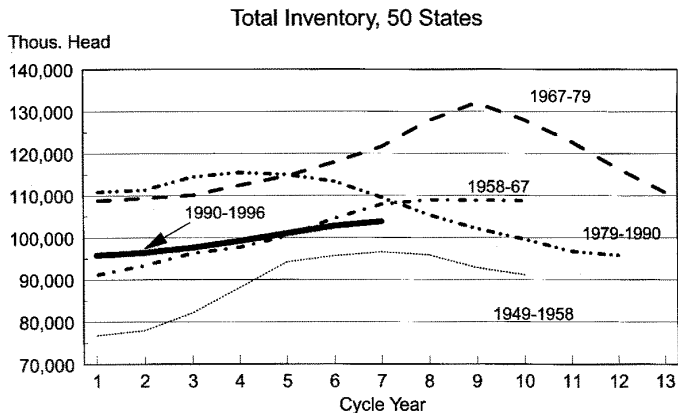
which can be used to judge where we are and where we are headed within a given cattle cycle.

### *Inventory Cycles: What and Why*

Cycles are measured from one trough to the next trough. The average length of the six full cycles in cattle inventories since 1928 has been about 10 years (Figure 1). On average, inventories increased about 6 years during each cycle, but during the last full cycle (1979-1990) cattle inventories increased just 3 years before producers began to liquidate their herds. Historically, periods of declining cattle inventories have averaged about 4 years. However, liquidation during the 1980s lasted 8 years, the longest liquidation phase on record. The cattle herd liquidation of the 1980s was apparently caused by an extended period of low prices attributable not only to cattle and beef supplies, but also to large year-to-year declines in beef demand. Relatively low prices of competing meats, and other factors related to changing consumer tastes and preferences for beef, led to the beef demand decline.

Prior to 1979, the long-term trend in the U.S. cattle sector was for inventories to increase. At each cycle's trough the all cattle and calves inventory was larger than the lowest inventory during the previous cycle and each successive inventory peak was greater than the previous cycle's peak. The cattle inventory peak during the 1979-1990 cycle was the first time the cycle's peak failed to establish a record high. In addi-

**FIGURE 1. CATTLE ON FARMS BY CYCLES**

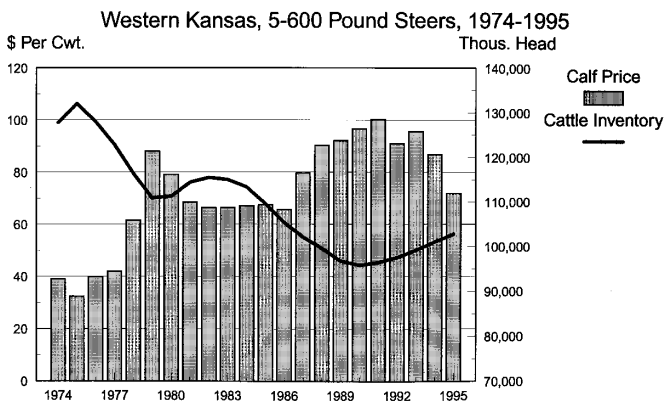


tion, the 1990 cattle inventory estimate marked the first time a cycle's inventory trough fell below the previous cycle's trough.

Cattle cycles occur in large part because of the biological nature of production. Cow-calf producers respond to profitable calf prices by holding back more replacement heifers and not culling as many cows. The increase in cow numbers leads to more calves the next year. But additional heifers held back for entry in the cow herd don't increase beef production for at least 3 years. Eventually, the increase in the cattle inventory and, subsequently, beef supplies leads to lower prices. Ultimately, prices decline below many cow-calf producers break-even level which leads higher cost firms to start liquidating their herds. Herd liquidation continues until prices return to profitable levels.

The time it takes production to respond to higher or lower prices creates a lag between price peaks (troughs) and subsequent inventory peaks (troughs). For example, annual average prices for 500-600 pound steers in western Kansas reached a cycle high of \$87.97 per cwt. in 1979, but the all cattle and calves inventory didn't peak until three years later in 1982 (Figure 2). Similarly, in the current cycle, the same weight steers averaged \$100.19 per cwt. in 1991 and it appears the all cattle and calves inventory peaked about 5 years later.

**FIGURE 2. CALF PRICES AND CATTLE INVENTORY**



The biological response time for a cattle cycle would be shorter than the average cycle's 10 year length. But cow-calf operators tend to keep increasing the size of their herds as long as calf prices remain profitable and tend to liquidate a portion of their herds as long as calf prices are unprofitable. Moreover, behavioral factors also influence the build-up and liquidation phases of cattle cycles. Some producers respond to early warning signs while others do not, leading to lags in producer response and thereby lengthening the cycle. Finally, the financial condition of producers can influence the speed with which they respond to either profitable or unprofitable calf prices.

Beef demand has also played a role in the cattle cycle. Population growth and growing consumer incomes led to long term growth in beef demand until the 1970s and 1980s. In turn, long term growth in beef demand helped produce an upward trend in cattle inventories and beef supplies. But in the 1980s, declines in beef demand helped cut short the expansion phase of the 1979-1990 cattle cycle as calf prices fell to unprofitable levels more quickly than during previous cattle cycles and producers began to liquidate a portion of their herds. Declining beef demand during the 1980s contributed to the unusually long liquidation phase of the last cattle cycle.

***Cycle Indicators and The Current Cycle***

Several indicators can be used to monitor the stage of the cattle cycle. Although no single indicator is perfect, using several indicators together can provide insight into the current cattle cycle.

The current cattle cycle began in 1990 when the U.S. cattle and calf inventory was 95.8 million head. That was the smallest total inventory since 1959 when the U.S. inventory was just 93.3 million head. The current cycle entered its seventh year in 1996.

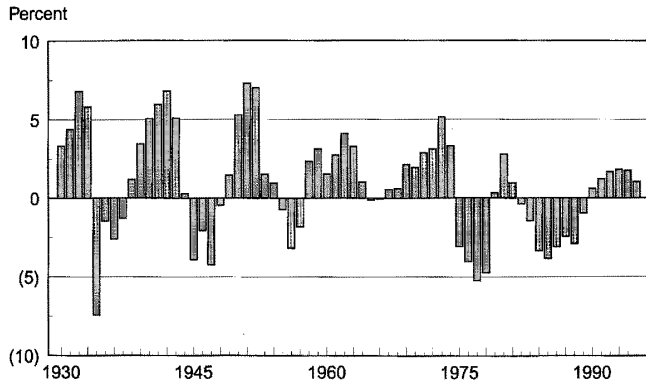
Calf prices peaked during the current cycle in 1991, averaging \$100.19 per cwt. for 500 to 600 pound steers in western Kansas. But declining prices in 1992 were followed by an increase in calf prices during 1993 due to higher fed cattle prices caused by the harsh winter of 1992-1993. That "false signal" of increasing calf prices in 1993 probably extended the expansion phase of this cattle cycle and helped exacerbate the industry's price problems in 1996.

***Inventory Growth Rate***

A growth rate is simply the year-to-year percentage increase in the inventory. Growth rates vary widely from one cycle to the next. The growth rate of the all

cattle and calves inventory during this cycle has been modest compared to previous cycles. For example, since 1990 the rate of growth in the all cattle and calves inventory was never greater than 1.8 percent whereas previous cycles often recorded year-to-year increases in the cattle inventory of more than 5 percent (Figure 3).

**FIGURE 3. PERCENT CHANGE IN CATTLE INVENTORY 1930-1996**



The rate at which cattle inventories can expand before the resulting increase in supplies leads to lower prices is largely dependent on how rapidly aggregate beef demand grows. It appears that rapid growth rates were sustainable for longer time periods in previous cattle cycles because the combination of a growing domestic population and increasing consumer incomes were producing larger aggregate increases in beef demand than has been the case in recent years. Additionally, growing productivity in the beef sector represented by the trend of increasing beef production per cow also means that any given herd growth rate today will lead to a larger beef supply increase than was the case during previous cattle cycles. Recent evidence suggests that total herd growth rates in excess of one percent for several years are sufficient to push fed and feeder cattle prices lower. However, in the future, continued growth in beef exports could once again put beef in a position where faster herd growth rates are sustainable.

**Cow and Heifer Slaughter**

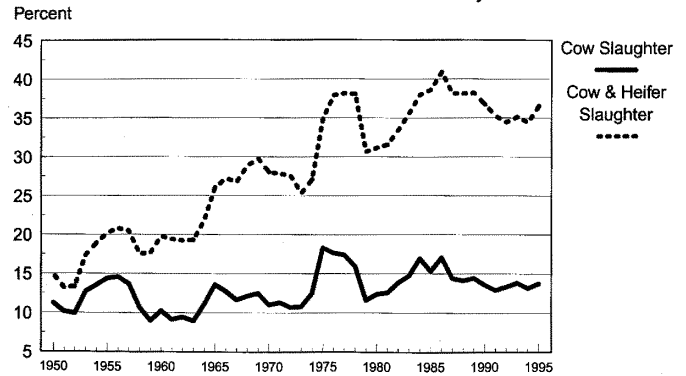
Historically, cow slaughter less than about 13 percent of the January 1 cow inventory indicated herd buildup. Cow slaughter rates greater than 14 to 15 percent have generally been a sign of herd liquidation. During the current cycle, cow slaughter as a percent of the January 1 cow inventory has ranged between 12.9 and 13.8 percent (Figure 4).

Cow and heifer (total female) slaughter as a percent of the cow inventory can also be used to indicate herd growth and liquidation. The addition of heifer slaughter provides some information regarding heifer

retention rates which can be viewed as another leading indicator of the cow herd's future size.

Annual total female slaughter greater than about

**FIGURE 4. COW AND HEIFER SLAUGHTER As a Percent of Cow Inventory**



38 percent of the cow herd inventory has been indicative of herd liquidation while female slaughter totaling less than approximately 37 percent of the cow herd has been associated with herd growth. Since 1990, total female slaughter ranged from 34.4 to 36.5 percent of the January 1 cow herd. Consequently, female slaughter data during this cycle has been consistent with the relatively slow herd growth rates that have been observed, but the 1995 data indicated that the industry was poised to switch from the expansion phase of the cattle cycle to the liquidation phase.

**The Cattle Cycle and Beef Production**

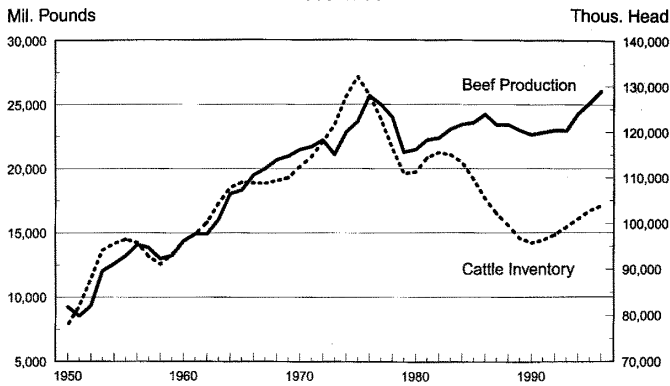
When examining the cattle cycle, producers should remember that many things have changed over the last 20 years. In addition to changes in beef demand, important changes have occurred in cattle production, especially in cattle weights. These factors have impacted the cattle cycle and will continue to do so.

Estimated commercial cattle dressed weights increased from a 1975 average of 575 pounds to 705 pounds during 1995, an increase of 130 pounds. Heavier dressed weights are attributable to changing herd genetics and management systems. Over the same time period, the increase in dressed weights and a long term decline in calf slaughter helped push estimated beef production per cow up 35 percent to 563 pounds per cow in 1995.

The implications for the current cycle are clear. Beef production today is about the same as that of the 1970s, but with 12 million fewer cows (Figure 5). Although the cattle inventory grew by less than 2 percent annually in the 1990s, beef production increased by almost 6 percent in 1994 and 3 percent in 1995. During the expansion phase of this cycle, small increases in cattle inventories had much larger impacts

on U.S. beef production than in previous cycles. Now that the liquidation phase of the current cattle cycle has emerged, the reverse is true as well. Fewer cows need to be liquidated than in past cycles to have a large impact on beef production.

**FIGURE 5. BEEF PRODUCTION AND CATTLE INVENTORY**  
1950-1996

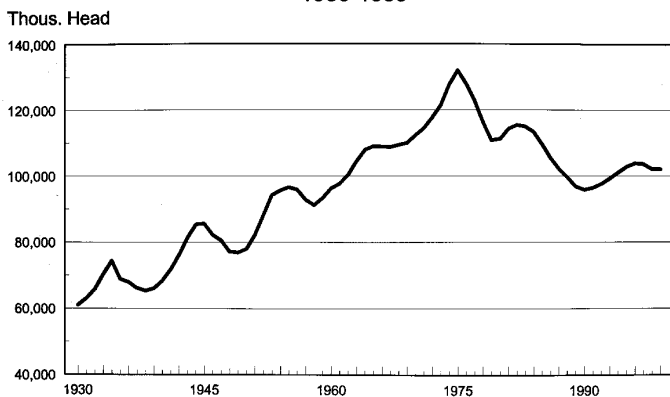


**Projections**

Cow-calf producers absorbed large losses in 1995 and are expected to lose money again in 1996. Consequently, the U.S. cow herd is expected to reach its cyclical peak in 1996. If cow slaughter continues at the pace established during the first half of 1996, the January 1, 1997 cow inventory and the total U.S. cattle inventory are both likely to fall below their 1996 levels.

Long-term, calf prices are expected to remain at unprofitable levels through 1997 and the lack of profitability will probably lead to even smaller cattle herd inventories by January 1998 (Figure 6). The length and severity of this liquidation phase depends heavily on the weather and feed markets. Prolonged severe drought may force liquidation in some parts of the country. Continued high feed costs will pressure calf and feeder cattle prices, leading to even larger losses in the cow-calf sector and more rapid liquidation. Alternatively, larger corn acreage and a return to long term trend yield levels combined with improving mois-

**FIGURE 6. U.S. CATTLE INVENTORY**  
1930-1999



ture and pasture conditions in the Southern Plains could slow the rate of liquidation and lead to a longer liquidation phase.

Two other factors, besides weather and feed grain prices, could be important in the liquidation phase of the current cattle cycle. Cow-calf producers had a long string of profitable years in this cycle and their balance sheet strength may result in some delays in breeding stock liquidation, particularly in regions where drought and poor pasture conditions are not limiting factors. Second, U.S. beef exports have grown dramatically in recent years. If that trend continues, foreign demand for U.S. beef will absorb an increasing share of U.S. production and provide more support to domestic cattle prices. However, despite the optimistic outlook for U.S. beef exports, it appears unlikely that increasing export demand will be sufficient to absorb enough of the expected increase in beef production to enable the U.S. cow-calf sector to return to profitability prior to 1998.