Cow-Calf and Feedlot Sessions:

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An Informed Veterinarian can Help Clients Profit from the Cattle Cycle

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Part I – Cattle Cycles

Why are cattle cycles important to veterinarians?

The cattle cycle is the single most important force impacting your clients' beef cow profits. The alternative "booms and busts" associated with the cattle cycle have long been of great concern to beef cow producers. Always the question arises as to why the beef industry cannot maintain a sustainable growth in animal numbers that would prevent the economic booms and busts associated with the cattle cycle.

Much of the year to year variation in beef prices is driven by cattle numbers (i.e., beef supply). The cattle cycle is the single most important force determining beef supply and cattle prices. As cattle numbers go up, beef prices go down. As cattle numbers go down, beef prices go up. It is almost that simple.[1]

If we can predict cattle cycles, then we should be able to predict beef price cycles. If we can predict beef price cycles, then we should be able to identify production strategies that will allow your beef cow clients to profit from the cattle cycle. When your beef cow clients profit from the cattle cycle, your veterinary practice will also profit from the cattle cycle.

So... Why are there cattle cycles?

The fundamental cause of cattle cycles is the biology of the beef cow. Once beef cow producers get the price signal to expand, and I don't know if they received that signal with their 1999 calves or not, it will take them three years to biologically expand their beef production. By the time that they are actually expanding beef production, the price signal is to contract beef production. The expansion decision to divert heifers from feeding to breeding results in even less beef being produced. This, in turn, amplifies beef prices upward even more, sending an even stronger expansion price signal. The biological lag between the price signal to expand and the actual expansion is what causes cattle cycles.

If veterinarians are going to help make the cattle cycle work for beef cow producers, veterinarians need to clearly understand cattle cycles.

Understanding cattle cycles

While U.S. cattle numbers are recorded back to the mid-1800s, the cattle cycles illustrated in Figure 1 go back to 1940. We had a cattle cycle in the 1940s, another in the 1950s, one in the 1960s, and then we had a cattle cycle in the 1970s. The U.S. All-Cattle Number peaked during the 1970s at 132 million head of cattle. There was a cattle cycle during each of these decades and each cattle cycle peaked at a level above the previous cycle.

After the all-cattle number peaked in the mid-1970s, we had a very sharp liquidation in cattle numbers during the late 1970s; however, we had another cattle cycle in the 1980s. Note (Figure 1) that the "expansion" phase for the 1980 cycle was the shortest on record. (We divide cattle cycles into expansion, contraction, and turnaround phases.) After cattle numbers peaked in 1982, cattle numbers again started contracting and continued contracting through 1989. From 1989

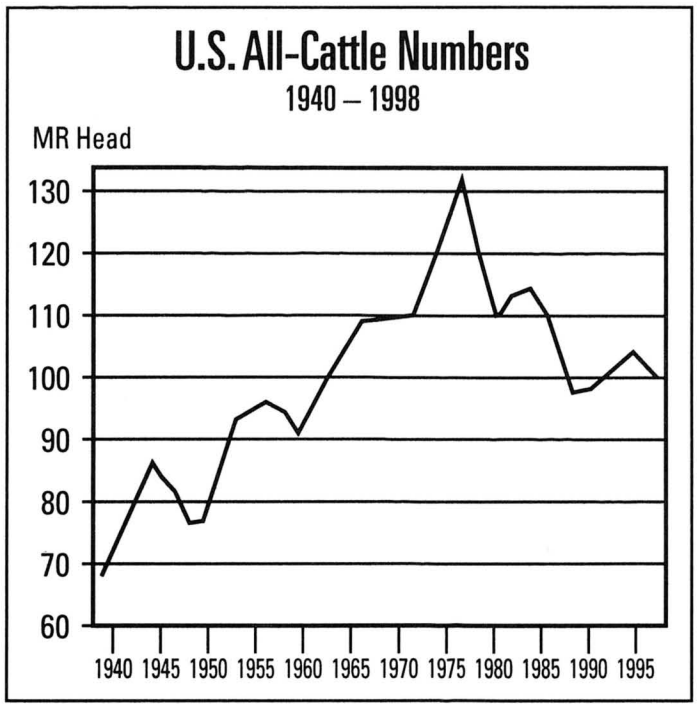

Figure 1. U.S. All-Cattle numbers.

through Jan 1, 1996, cattle numbers again expanded. Since 1996, cattle numbers have been contracting.

The All-Cattle January 1, 2000 inventory was 98.0 million head – down 1percent from the 99.1 million head a year earlier, confirming that this is the fourth year of cattle contraction. I project that the January 1, 2000 All-Cattle Inventory will be the fifth year of this cycle's contraction.

Two things are needed to expand cattle numbers

We are now in the turn-around stage of the current cattle cycle. Analysis points out that it will take two things to increase the All-Cattle Inventory numbers. First, cattlemen will need to hold back heifer calves by diverting them from feeding to breeding; however, this has not yet happened.[2] Second, producers will need to reduce beef cow cullings. Interesting enough, beef producers have already done this. In total, cow slaughter is down 22 percent from the 1996 high.[3] Now all that is needed to trigger a herd expansion is for beef cow producers to hold back more heifers for breeding. The first possible increase in holding back additional replacement heifers now appears to be with year 2000 calves.[4]

Cattle cycles cause beef price cycles

The 10-year cattle cycle corresponds closely to the calendar decades. A decade starts out with a low all-cattle number, that number increases to a peak around the middle of the decade and then decreases back to a new low all-cattle number at the end of the decade. Nominal beef prices, on the other hand, go in the opposite direction of the all-cattle number.

Nominal beef prices start out a decade at a relatively high level, decrease to a low during the middle of the decade and then return to a high at the end of the decade. The key here is that cattle cycles are predictable, cattle cycles cause beef price cycles, and the two cycles go in opposite directions.

Beef price cycles cause "u-shaped" profit curves

Figure 2 summarizes North Dakota's beef cow profits during the decade of the 1990s.[5] Beef cow profits also go in a predictable pattern over each decade as illustrated in Figure 2. The decade of the 1990s began with very high net returns to beef cow producers and then deteriorated in the middle of the decade. Net returns for this decade bottomed out in 1996.

Nineteen-hundred-and-ninety-seven showed a dramatic turn up in beef cow net earnings but the rapid turn around was not sustainable. Average net returns per cow again dropped in 1998. Net earning in 1999 again continued the upward trend. I am projecting a continued upward trend in earned net returns in year 2000. This typical decade-long earned net profit pattern from beef cows – high at the beginning of the decade, low in the middle of the decade and high again toward the end of the decade – is representative of a typical 10-year "U-shaped" beef profit curve.

I am projecting a similar "U-shaped" profit curve in the current decade (2000 - 2010). The reason for another "U-shaped" profit curve is the same biological lag in beef production described earlier in this paper.

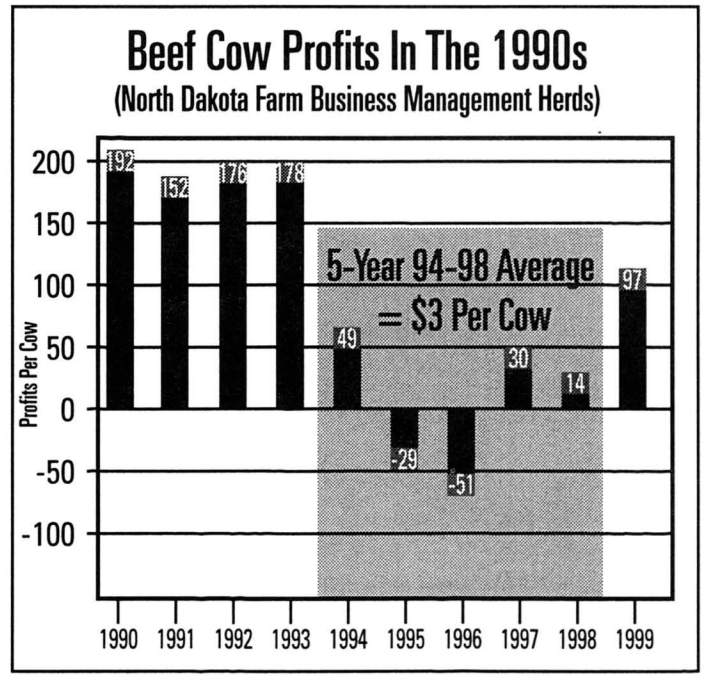

Figure 2. Beef cow profits in the 1990s.

Part II. Making The Cattle Cycle Work For Beef Cow Operators

As a cattle cycle progresses through the contraction phase into the turn-around phase and into the expansion phase, price relationships and unique profit opportunities will change. All of this suggests that the optimum beef cow herd production and marketing strategy changes with the changing phases of the cattle cycle.

Using a single production and marketing strategy over a total cattle cycle, as many beef cow producers practice, leads to substantial opportunity loss in long-run profits. But, before we look at alternative production and marketing strategies, let's first review what the typical beef cow producer will do in response to today's high prices.

a) What will a typical beef cow producer do?

When a typical beef cow producer gets the price signal to expand, he will begin holding back additional heifers within his herd. After getting the price signal with his 2000 calves, this producer will respond by holding back additional 2000 heifers and even holding back some added 2001 heifers.

Heifer retention in 2001 and 2002 will immediately drive near term aggregate beef production down as these heifers are diverted from the feedlot; however, when these heifers' calves are slaughtered, aggregate beef production will increase. This increased beef production triggered by increased heifer retention should start increasing somewhere around 2003 and continue increasing though 2006. By 2005, or before, a strong liquidation signal will be sent causing more and more cull cows to be dumped on the market driving beef prices even lower in 2006. The beef price cycle from the 1996 low to the 2006 low will then be complete.

These dramatic swing in beef prices, and the resulting biological lag, cause the cattle cycle. The aggregated net result of the cattle cycle is more beef being produced during times of low prices and less beef being produced during times of high prices.

b) Increase production in profitable years

Let's now take a look at some heifer retention strategies that could make the cattle cycle work for a beef cow producer. Let me first pose a question. Given the typical "U-shaped" beef price cycle that we experience in the cattle industry, should a beef cow producer cull his beef cows the same way going up the beef price cycle as he did going down the beef price cycle? North Dakota's Cow Herd Analysis and Performance System (CHAPS) data suggest that ranchers typically cull 14 to 15 percent of their cows, on the average, up the cycle and down the cycle.

Iowa State University research suggests that changing a beef herd's culling rate as the herd progresses though a 10-year cattle cycle can result in an overall higher average net income for the complete cycle. In fact, what is needed is a heifer retention strategy that will increase production in profitable years and reduce production in unprofitable years. This same research suggests that such a heifer retention strategy would generate a higher average profit and a greater net worth over the complete cycle than the more traditional constant replacement strategy.[6]

Now back to my original question. Should beef cow producers cull cows the same on the upward side of that U-shaped price cycle as they do on the downward side? My answer is no. I suggest that on the downward side of the beef price cycle, when beef cows are generating very little profit or are even losing money (as in 1994 though 1996), producers should cull and cull deep. I suggest that beef cow producers should remove individual cows that are losing money and replace them with low-priced retained heifers. Perhaps that producer has been thinking about changing genetics for several years and this low priced-time of the beef price cycle is an optimum time for a producer to get his herd up to maximum production potential — however he defines it for his herd.

Then, on the upward part of the beef price cycle (1999 though 2002), a beef cow producer should not hold back any replacement heifers and sell every calf born. Use this high-priced time to build a financial reserve designed to take them through the cycle's next low-priced years. Quite frequently a beef cow business does not make it through that business' second cycle's low prices.

c) Hold back heifers during low-priced times

Due to the repetitive nature of the 10-year beef price cycle, heifers born during the low- price period tend to produce calves during the next high-price period. Heifers born during the high-price period tend to produce calves during the next low-price period. Let me illustrate. Do any of your clients have their 1997 heifer calves? Let's see .... born in 1997, bred in 1998, and calved in 1999, 2000, 2001, 2002, 2003 etc. right over the top of the calf price cycle (Figure 3).

My data analysis suggests that 1997 born heifer calves were the second-most profitable replacement heifers held back. My analysis further suggests that the most profitable bred heifer started producing calves in 1987. If a client did not hold back any 1997 heifer calves, no problem. He can hold back heifers again in year 2007. That is how the 10-year cattle cycle works!

d) Don't always cull cows with small calves

During the decade of the 1990s, I spent my spring months going from kitchen table to kitchen table ana-

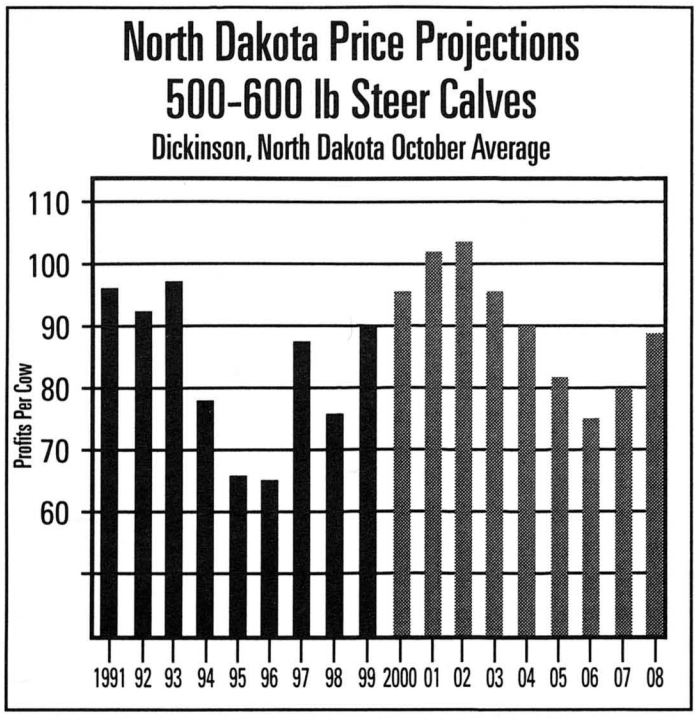

Figure 3. Price projections for 500-600 lb steer calves.

lyzing the cost and returns for Integrated Resource Management (IRM) cooperators' beef cow herds. For herds with CHAPS herd performance records, we could calculate costs of production for 18 different groups of cows in the herd — 6 grouped by alternative calving intervals, 11grouped by age of cows, and a final group made up of the total herd.

My economic analyses did not validate the standard recommendation at that time to cull all cows with late-born calves. In 1990 though 1993, every cow analyzed that had a calf, regardless of when the calf was born, made a profit. I concluded from this early IRM work that the high-priced time of the beef price cycle is not the time to cull cows with late-born calves.

My kitchen table analyses suggested that while some high-producing cows generated a profit from 1994 though 1996, many of the low- and middle-producing cows did not generate a profit during these tough years. I concluded that a better time to cull cows with late-born calves is during the downward portion of the "U-shaped" price curve as these cows became unprofitable. Culling these unprofitable cows heavily during low calf prices of 1994, 1995 and 1996 proved to be more profitable.[7]

The above culling strategy is a management strategy that focuses on reducing production when a producer's unit cost of production is above market prices and expanding production when the producer's unit cost of production is below market price. In fact, with the 18 cow groupings described above, this unit cost of production decision rule can be applied to each of the 18 cow groups, always focusing on the immediate removal of any cows that are losing money. I used to ask producers, "Why do you run cows that lose money? Is it that you don't know which cows are losing money, or is it that you don't care? Why do you do that?" The answer that I typically received was, "I have the grass!" I would respond by asking, "What's the economic gain from marketing grass through cows that lose money?"

e) Age cow herd to maximize life-time production is during high-prices

Ideally, I would like to have all my cows to be four years of age in 1999. That way, their life-time maximum annual production (as 4, 5, 6, and 7 years olds) would be during the high-priced years. This is very difficult to do. Many herds do the opposite and actually age during the low priced years of a cattle cycle. Why not cull the cows that lose money, during the low priced-years, and replace them with younger, better heifers? Now you have a younger herd going into the high-priced years. Then, when the beef industry returns to strong cattle prices (1999 through 2003), these new cows will be near their annual life-time production peak and you can sell all these heavier calves at high prices. This strategy would allow a beef cow producer to build a financial reserve in anticipation of the tough times projected to again return during 2004 to 2006.[8]

Summary

The cattle cycle is the single most important force impacting your beef cow clients. The alternative "booms and busts" associated with the cattle cycle have long been a concern of cattlemen. The impact of cattle cycles may also be the single most important factor impacting your veterinary practice. Veterinarians are encouraged to grasp a fundamental understanding of cattle cycles and then use this cattle cycle knowledge to advise beef cow clients how to make the cattle cycle work for them. The purpose of this paper is to describe and analyze the cattle cycle and then present some heifer retention strategies that a veterinarian can recommend to clients to make the cattle cycle work for them.

Section I of this paper focused on the cattle cycle. Cattle cycles tend to last around 10 years and corresponding to the decade. The decade starts out with low cattle numbers, increases to a peak number in mid-decade only to decrease again at the end of the decade. Then, the cattle cycle repeats again in the next decade. What causes cattle cycles is the biological lag between the price signal to expand and the actual beef expansion. Since no one is taking about changing the biology of the beef cow, I suggest that the cattle cycle is live and well.

The cattle cycle can be divided into three phases — expansion, contraction, and turn-around phase. We are now approaching the end of the contraction phase.

The increase in calf prices, since October 1999, is signaling the beginning of the turnaround phase. Cow culling has dropped off substantially, but heifer retention is still very, very, low. Once heifer retention increases, we will complete the turn-around phase and enter into the expansion phase. I predict that we will move into the expansion phase with the marketing of year 2000 calves.

Cattle cycles cause beef price cycles but cattle cycles and beef price cycles go in opposite directions. Nominal beef prices start out the decade at a relatively high level, decrease to a low by the middle of the decade, and then return to a high at the end of the decade.

Research indicates that beef cow profits can be increased with a heifer retention strategy that increases production in profitable years and reduces production in unprofitable years. This research suggests that such strategies would increase long-term profits and increase long-term net worth. Part II of this paper focused on identifying heifer management strategies that would increase production in the profitable years and decrease production in the unprofitable years.

In summary, the beef industry spends about 5 years building the beef cow herd and then spends about 5 years taking the cow herd apart. My recommendation is to develop a counter-cyclical culling strategy designed to enhance net income over the total cattle cycle. Cull deep when calf prices are low, generate cash flow from these heavy cull sales and hold back low-priced heifer calves. Then, reduce culling when cattle prices are high and sell all calves born. Use the high-priced time in the cycle to build a financial reserve for the next cyclical price low.

As a final comment, this paper only scratches the surface in identifying profit enhancing cattle cycle strategies. I encourage veterinarians to get together as a group and brainstorm how their clients might make the cattle cycle work to beef cow producers advantage.

Footnotes

[1] Today, beef demand appears to be playing a major part in determining the beef price strength for 1999 and so far in year 2000. This is the first time in over 20 years that demand has strengthened.

[2] Based on the January 2000 All-Cattle Inventory, intentions were to hold back only 5.53 million replacement heifers — down slightly from the low number one-year earlier and down 4 percent from 2 years ago. Clearly, heifer retention is not yet poised for expansion.

[3] Cow slaughter was down 11.2 percent in 1997 from 1996, down another 8.7 percent in 1998, and down another 3.4 percent in 1999. Year-to-date beef cow slaughter for the week of April 20th, 2000 was down 10 percent from a year earlier and current cow slaughter continues to run below a year earlier.

[4] The significant number in the USDA January 1, 2000 All-Cattle Inventory was the continued reduction in beef heifers intended for replacements. Instead of breeding 1998 and 1999 heifers, we apparently are still feeding these heifers. The slowdown in the decrease of heifers held for replacement, compared to the large reduction in 1998, suggests that we are in the early stages of the turn-around phase.

[5] Profit is defined as earned net returns to unpaid family and operator labor, management, and equity capital. These are the three resources (and the only three) contributed by the ranch family to the beef cow business.

[6] John Lawrence and Zhi Wang, "Profiting From The Cattle Cycle," SP-41, July 1996, Department Of Economics, Iowa State University.

[7] In fact, bred cow prices were still very strong in 1994 even though calf prices were weakening.

[8] Yes, I understand that most producers will probably need to cull some cows from 1999 though 2003. So, let's modify this strategy to: " increase culling to an absolute maximum during times of low prices and reduce cullings during high prices and then just sell as many calves as heavy as possible during the times of high prices." Producers could then use the high-priced time to build a cash reserve.