Evaluating Cattle Cycles:

Changes Over Time and Implications

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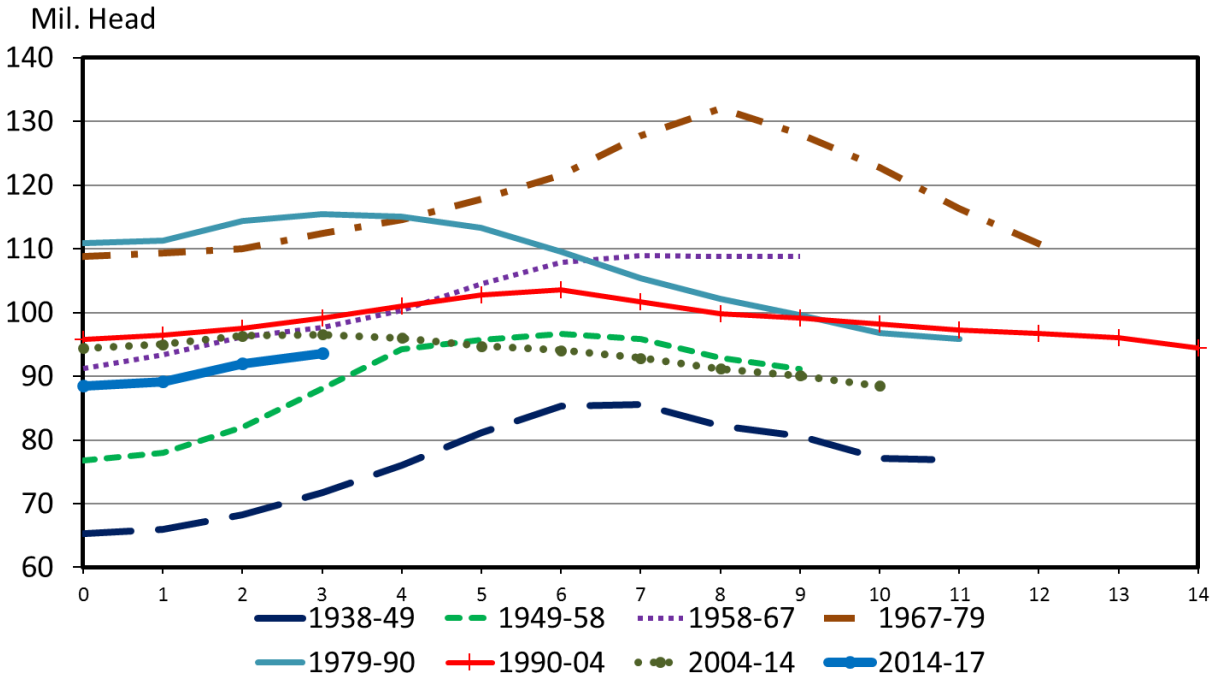
The U.S. beef industry is operating in a period many stakeholders would characterize as volatile on a multitude of fronts. In years past, a particular point of interest has been if and when will the U.S. beef cow herd expand. These discussions lead producers and industry participants to think about 'cattle cycles." Now that the new cattle cycle is here, one of the more heavily discussed questions has been what does the future hold for cattle producers. The start of a new cattle cycle paired with decreasing prices, dating back to mid-2015, has led many to evaluate the current situation relative to past history. This fact sheet summarizes how cattle cycles have changed over time and highlights implications for current herd size discussions.

Cattle Cycle Concept

The concept of cattle cycles refers to the historic tendency for cattle producers to expand and reduce production resulting in cyclical inventories over time. While no universal rules exist for identifying a given cycle, a duration of 9 to 13 years characterizes past cycles as typically identified by analysts. The duration of these cycles reflects the biological lags inherent in raising cattle and the rate at which profits (losses) are mitigated by expansion (contraction) of herds. Figure 1 indicates the current cycle, specified to have initiated in 2014, is in its fourth year. Coupling this with observations of 2016 profits being the first year of losses for cow-calf producers since 2009 and the associated increases in beef production, may lead producers to think that herd expansion is looking to slow and profits returning to long-term levels.

Figure1. Total U.S. Cattle Inventory, Jan.1



Keeping Cattle Cycles in Context

It is useful to dig deeper into the patterns of cattle cycles over time. Table 1 presents summary statistics of beef cow inventories within the current and previous six cattle cycles. This table provides tabular information confirming a visual observation from inspection of figure 1 -- namely that cattle cycles are "becoming flatter" over time. The variation of inventories within a given cattle cycle are declining over time. The range between maximum and minimum inventories has declined over the past four cycles. For instance, the three cycles spanning the 30 years between 1949 and 1979 involved herd adjustments of 9,740 head or more. This magnitude of total inventory adjustments has been notably reduced over more recent cycles.

The coefficient of variation (COV) is an alternative measure which assesses inventory variations in a context relative to base inventories within each cycle. Table 1 shows COVs have declined consecutively over all cycles going back to 1949. Combined, the COV and range statistics indicate the changes in inventories within cattle cycles have become less pronouced over time.

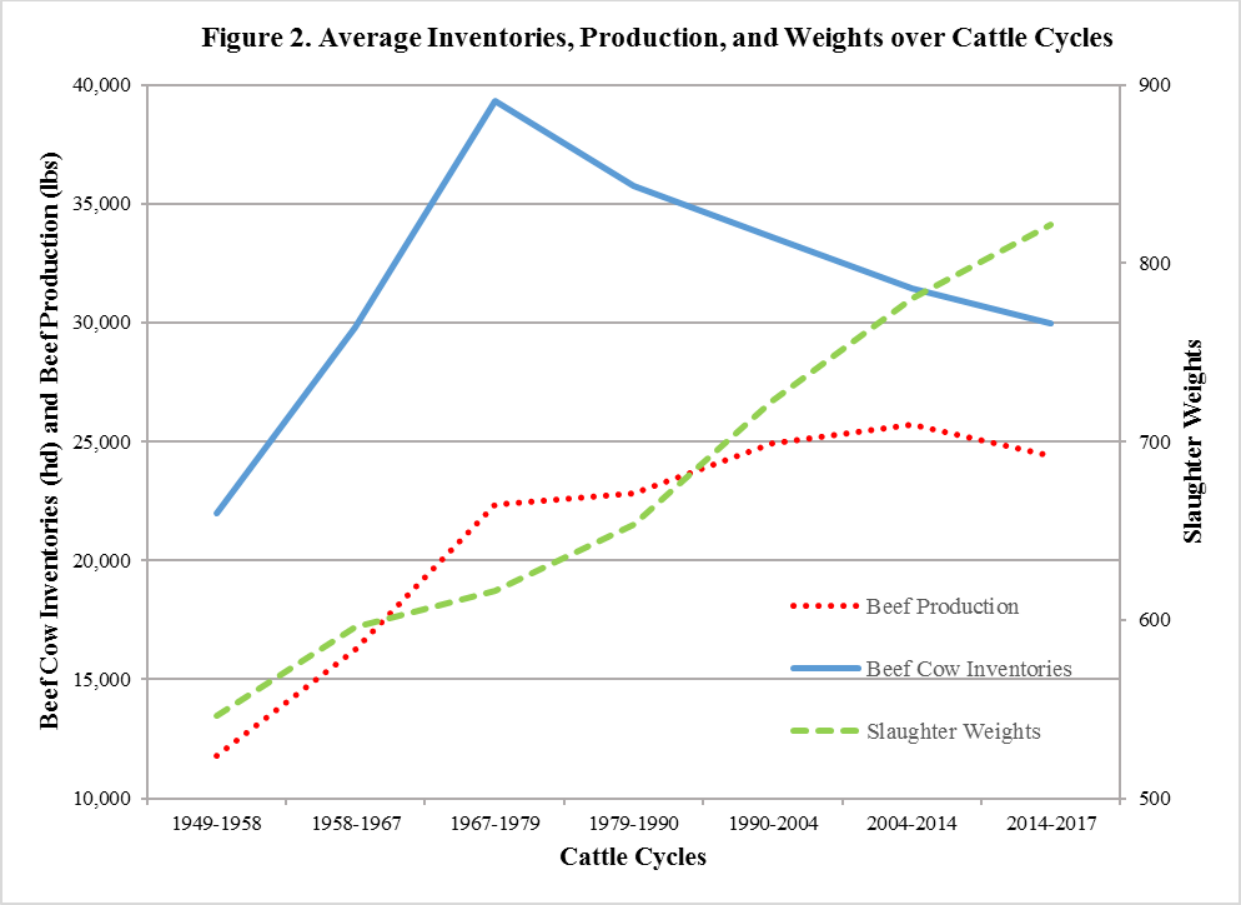
Table 1. Inventory Statistics Within Historic Cattle Cycles							
	1949-1958	1958-1967	1967-1979	1979-1990	1990-2004	2004-2014	2014-2017
Average	22,012	29,841	39,318	35,735	33,612	31,467	29,982
Maximum	25,659	34,708	45,712	39,230	35,319	32,703	31,210
Minimum	15,919	24,165	34,708	32,455	32,455	29,085	29,085
Range	9,740	10,543	11,004	6,775	2,864	3,617	2,125
Standard Deviation	3,724	4,054	3,438	2,487	926	1,315	983
Coefficient of Variation	0.169	0.136	0.087	0.070	0.028	0.042	0.033
Note: Values shown are January 1 beef cow inventories (1,000 head).							
Source: Livestock Marketing Information Center							

To better appreciate industry changes associated with the "flattening" of cattle cycles, it is worth further assessing patterns in beef production and cattle slaughter weights across historic cattle cycles. Table 2 shows how across multiple cycles commercial beef production, like beef cow inventories, has declined in variability. Conversely, slaughter weights have been notably less variable within cattle cycles (COVs are notably lower in every cattle cycle than beef cow inventories and beef production).

Table 2. Beef Production Statistics Within Historic Cattle Cycles							
	1949-1958	1958-1967	1967-1979	1979-1990	1990-2004	2004-2014	2014-2016
Average	11,770	16,235	22,356	22,833	24,956	25,701	24,387
Maximum	14,090	19,991	25,667	24,213	27,090	26,561	25,212
Minimum	8,549	12,983	19,991	21,262	22,634	24,252	23,698
Range	5,541	7,008	5,676	2,951	4,456	2,310	1,514
Standard Deviation	2,142	2,557	1,754	878	1,523	816	766
Coefficient of Variation	0.182	0.157	0.078	0.038	0.061	0.032	0.031
Note: Values shown are commercial beef production (1,000 lbs.).							
Source: Livestock Marketing Information Center							

Table 3. Slaughter Weight Statistics Within Historic Cattle Cycles							
	1949-1958	1958-1967	1967-1979	1979-1990	1990-2004	2004-2014	2014-2016
Average	546	596	616	653	723	780	822
Maximum	575	608	639	686	765	808	829
Minimum	527	575	589	630	686	757	808
Range	48	34	51	56	79	52	21
Standard Deviation	13	11	14	20	25	14	12
Coefficient of Variation	0.025	0.019	0.024	0.030	0.034	0.018	0.014
Note: Values shown are cattle slaughter weights.							
Source: Livestock Marketing Information Center							

Figure 2 presents the average beef cow inventory, beef production, and slaughter weight for each cattle cycle. This chart reveals a central reason beef cow inventory variability within cycles has been declining over time is the industry has responded by adding more pounds of beef produced ultimately from each cow in the herd. Slaughter weights have persistently increased over time offsetting declining beef cow inventories resulting in increasing beef production. Observations from the new cattle cycle, 2014-2016, further illustrates this point as we began to observe cattle slaughter weights well over 800 lbs. This effectively reduces demand for beef cows, relative to the past where less beef was produced per animal moving through the industry's supply chain.



Implications

The observation of beef cow inventory variability within cycles declining over time has direct implications for producers evaluating the current situation and contemplating entry-exit decisions in the context of where the industry is at in the current "cattle cycle." Narrowly, producers should recognize the industry's efficiency gains as evidenced by increasing slaughter weights offsetting declining inventories and subsequently note the national beef cow herd is unlikely to return to historic levels.