# The Cattle Inventory Semi-Annual Signal, Read as the Longest-Lead Structural Supply Anchor on Live Cattle

*Why USDA NASS semiannual beef cow herd YoY, sign-flipped and z-scored on two years, catches structural supply direction 18 to 30 months ahead – the longest biological lead signal in the cattle complex.*

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## What this signal is, with the limits stated upfront

The USDA National Agricultural Statistics Service publishes the Cattle Inventory report twice per year – January 31 and July 24 – covering the total US beef cow herd count. The year-over-year percent change in beef cow herd is the structural supply signal at the longest biological lead available in the cattle complex.

The reproductive mathematics are straightforward. A bred cow produces a calf 9-10 months later. That calf grows out for 12-15 months before entering feedlots. Feedlots finish cattle in 4-6 months before slaughter. Total biological lead time from breeding decision to slaughter: 18 to 30 months. The herd YoY signal catches structural supply direction at the longest possible lead. No other signal in the cattle complex looks further ahead.

This signal computes the year-over-year change in beef cow herd count, SIGN-FLIPS so that herd contraction (negative YoY) reads positive composite (bullish-LC regime), and bounds with tanh on a 504-day rolling window. State thresholds at plus or minus 0.2 (moderate) and plus or minus 0.5 (extreme).

Here is the honest finding. Daily Spearman IC against LC fwd60d is plus 0.113 at p-value less than 1.0e-5 across 9,049 trading days – STRONGLY significant. This is the strongest IC in the LC fundamental stack. Phase +1 (Herd Contraction) delivers +2.07 percent fwd60d at 65.3 percent hit rate, +1.05 pp above the +1.02 percent baseline. Phase –1 (Herd Expansion) delivers –0.36 percent at 46.2 percent hit rate, –1.38 pp below baseline. Phase 0 (Normal) delivers +0.40 percent at 53.4 percent hit rate, –0.62 pp below baseline.

This is a Grade B+ directional structural signal. Both tails directional with meaningful edge. Non-overlap p=0.25 is closer to significance than most magnitude overlays. Treat as the structural supply anchor at the longest lead in the LC fundamental stack.

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## How the structural supply mechanism composes

Beef cow herd changes transmit to cattle supply through the biological reproduction cycle. The sign flip is critical: herd CONTRACTION (negative YoY) means fewer breeding cows today, which means fewer calves, which means fewer feeder cattle, which means tighter cattle supply 18-30 months out, which means forward LC strength. The composite flips sign so that positive composite reads bullish-LC.

Herd EXPANSION (positive YoY) means more breeding cows today, more calves, more feeder cattle 18-30 months out, plentiful supply, forward LC weakness. Negative composite reads bearish-LC.

The Normal zone (composite within plus/minus 0.2) is where the herd is tracking prior-year closely. Structural supply direction is neutral. Forward returns compress to slightly below baseline because the market has no structural edge.

This structural interpretation is why the signal is the longest-lead in the stack. LC-corn ratio catches feedlot margin cycles (6-12 months lead). FC-LC spread catches replacement-cost cycles (3-9 months lead). Cattle inventory catches structural herd cycles (18-30 months lead). The signal cadence is semiannual (two reports per year) but the structural view it provides is uniquely long.

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## What the state-conditional returns have actually done

> **Reference baseline – LC fwd60d (unconditional)**
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> CME Live Cattle back-adjusted continuous (LC20040BD) forward-60-day return baseline (unconditional): mean plus 1.02 percent, median plus 1.74 percent, standard deviation 8.01 percent, percent negative 41.8 percent. Sample window 1990-11-29 through 2026-10-30, 9,049 trading days with observable fwd60d.

Phase plus 1 (Herd Contraction, composite greater than plus 0.3) covers 4,170 trading days – 46.1 percent of the sample. Per-day mean fwd60d is plus 2.07 percent, hit rate 65.3 percent. Edge above baseline: plus 1.05 pp. The high sample share reflects multi-year herd-contraction cycles (2014-2015 drought-liquidation, 2004-2005, 1994-1995 post-liquidation windows).

Phase 0 (Normal, composite between plus and minus 0.3) covers 3,032 trading days – 33.5 percent of the sample. Mean fwd60d is plus 0.40 percent, hit rate 53.4 percent. UNDERPERFORMS baseline by 0.62 pp.

Phase minus 1 (Herd Expansion, composite less than minus 0.3) covers 1,847 trading days – 20.4 percent of the sample. Per-day mean fwd60d is minus 0.36 percent, hit rate 46.2 percent. UNDER-PERFORMS baseline by 1.38 pp.

Both tails are directional with meaningful edge. The Herd Expansion tail (currently firing) has the strongest absolute edge at −1.38 pp. The Herd Contraction tail has +1.05 pp edge but with much higher sample share. This is a true directional signal, not a magnitude overlay.

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## Three cases that frame how to read this signal

### Case 1: January 2014. Herd Contraction – post-drought multi-decade low.

Firing window: 2014-2015 with composite saturated-positive. The US beef cow herd hit multi-decade lows after the 2011-2012 Texas-Plains drought triggered the largest herd liquidation since the 1970s. The structural tightness persisted through 2014-2015 as the industry rebuilt slowly. Live cattle rallied to cycle highs over $170 in Q4 2014. The 2014 case is the canonical Herd Contraction anchor.

### Case 2: July 2018. Herd Expansion – post-rebuild overshoot.

Firing window: 2017-2018 with composite saturated-negative. The US beef cow herd rebuilt aggressively from 2014 lows – producers responded to high prices by retaining heifers and expanding operations. The herd-rebuild overshoot pushed feeder-cattle supply higher through 2017-2019. Live cattle weakened through 2018-2019 as the structural excess played out. The 2018 case is the modern-era Herd Expansion anchor.

### Case 3: January 2009. Herd Expansion – 2008 financial crisis demand destruction.

Firing window: 2008-2010 with composite saturated-negative. The financial crisis crushed beef demand through 2008-2009 while feedlots backed up with excess cattle from the prior-cycle expansion. The structural signal fired bearish across the full crisis window. Live cattle traded sideways-to-down through 2008-2010 as demand destruction persisted. The 2009 case documents a Herd Expansion firing coinciding with a demand shock.

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## How to use the signal today

As of October 30, 2026, the composite reads minus 0.717 – Herd Expansion EXTREME NEG, 95 trading days running. The USDA NASS Jul-2026 semiannual report confirmed the herd is in cyclical expansion mode as the industry rebuilds from 2022-2023 drought liquidation. CME Live Cattle trades the $220-230 range.

The current reading is in the Phase −1 band (below −0.3) in the EXTREME NEG sub-band (below −0.5). Historical Phase −1 delivers −1.38 pp below baseline at 46.2 percent hit rate; the extreme sub-band is typically a stronger signal than the moderate sub-band.

Pair with four confirming reads for direction:

- **LC-Corn Ratio Signal (Z15201)**. Grade A LC fundamental anchor on supply (medium-lead).
- **LC Feeder-Live Cattle Spread (Z15203)**. The other Grade A LC fundamental anchor (short-lead).
- **LC Weekly Cattle Slaughter YoY (Z15207)**. Realized supply-flow confirmation.
- **LC CFTC Positioning (Z15206)**. Commercial NET hedge regime read.

For the current Herd Expansion firing, this signal is bearish structural supply. If the medium-lead LC-Corn Ratio and short-lead FC-LC Spread also fire bearish, direction is high-conviction. If the medium and short leads disagree with Cattle Inventory, trust them for near-term direction – Cattle Inventory operates on an 18-30 month structural horizon that may not be reflected in 60-day forward.

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## Methodology notes

Data source. USDA NASS semiannual Cattle Inventory report (January 31 and July 24 release dates), total US beef cow herd count.

Signal construction. Herd YoY = (current herd - year-ago herd) / year-ago herd. SIGN-FLIPPED so that contraction (negative YoY) reads positive composite. Z-score on 504-day rolling window (approximately 2 years) with 60-day minimum sample. Tanh-bounded to [−1, +1]. State thresholds plus or minus 0.2 (moderate) and plus or minus 0.5 (extreme). Phase +1 above +0.3, phase −1 below −0.3.

Validation statistics. Daily Spearman IC against LC fwd60d is +0.113 at p-value < 1.0e-5 (n = 9,049 trading days) – strongly significant. Phase +1 state-conditional per-day mean fwd60d plus 2.07 percent, hit 65.3 percent (+1.05 pp above +1.02 percent baseline). Phase 0 mean plus 0.40 percent, hit 53.4 percent (-0.62 pp below baseline). Phase −1 per-day mean minus 0.36 percent, hit 46.2 percent (-1.38 pp below baseline).

Independence test. Non-overlapping (every-60d) sampling yields Spearman IC +0.095 at p-value 0.25 across 150 independent observations – not significant but closer to significance than most LC overlays. The daily significance partly reflects multi-year signal persistence from semiannual data cadence.

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## What this signal does not cover

Three things the signal does NOT read, and one broader caveat.

First, semiannual cadence means slow signal updates. Composite can be stale between January and July reports as the structural signal updates only twice per year. The daily tanh-bounded value reflects the most recent report and does not refresh until the next USDA NASS release.

Second, the 12-24 month biological lead means forward 60-day return is still partly noise relative to the signal time horizon. Use for structural view, not tactical trigger. The composite tells you the direction of structural supply pressure; it does not tell you when the pressure will transmit to prices.

Third, non-overlapping independence test is non-significant (p=0.25). The daily significance partly reflects autocorrelation through semiannual signal persistence.

Broader caveat: this is Grade B+ structural supply anchor at the longest lead in the LC stack. Treat as the big-picture directional overlay. Pair with medium-lead (LC-corn ratio) and short-lead (FC-LC spread, slaughter YoY) signals for confirmation.

*This research brief is for informational purposes only and does not constitute investment advice. Past performance is not indicative of future results. Signal reads reflect historical state-conditional statistics; any decision to act on signal readings is the reader's responsibility. Data sources: USDA NASS semiannual Cattle Inventory; CME Live Cattle back-adjusted continuous (LC20040BD). State-conditional statistics computed through 2026-10-30.*