The Hawkes Jump-Cluster Signal, Market-Microstructure Overlay on Live Cattle

Why rolling Hawkes-style jump-cluster intensity on CME Live Cattle, z-scored on two years, catches endogenous volatility clustering regimes – Grade B market-microstructure overlay distinct from all supply/demand fundamentals.

David Stendahl · Market Lab Analytics · November 1, 2026

What this signal is, with the limits stated upfront

Price jumps in financial markets cluster. The Hawkes self-exciting process is a well-studied model that captures this: large moves increase the near-term probability of further large moves. The endogeneity parameter – essentially the branching ratio – quantifies how much of current activity is self-induced versus exogenously driven.

When Hawkes endogeneity is low, the market is in a quiet regime where price moves are driven primarily by exogenous information rather than self-reinforcing cascades. When endogeneity is high, the market is in a chaotic regime where jumps breed more jumps and flow dynamics dominate information.

This signal reads a rolling Hawkes-style jump-cluster intensity on CME Live Cattle (Truth LC_T050 methodology, target branching ratio n-star equals 0.636), z-scores on a 504-day rolling window, and bounds with tanh. Positive composite equals HIGH intensity = chaotic regime. Negative composite equals LOW intensity = calm regime. State thresholds at plus or minus 0.2 (moderate) and plus or minus 0.5 (extreme). Daily release cadence.

Daily Spearman IC against LC fwd60d is minus 0.059 at p-value less than 1e-7 across 9,049 trading days – significant daily. Non-overlapping (every-60-day) IC is minus 0.157 at p-value 0.055 across 150 independent samples – BORDERLINE significant. Phase +1 (Chaotic Regime) delivers +0.82 percent fwd60d at 55 percent hit rate, −0.20 pp below the +1.02 percent baseline. Phase −1 (Calm Regime) delivers +1.42 percent fwd60d at 61 percent hit rate, +0.40 pp above baseline. Phase 0 (Normal) delivers +0.52 percent.

This is a Grade B market-microstructure overlay. The signal reads flow-regime context, distinct from all supply/demand fundamentals. In calm regimes, fundamental signals have cleaner transmission to forward returns.

How the microstructure mechanism composes

Observed price volatility decomposes into two components: exogenous (news, fundamentals, information arrival) and endogenous (self-reinforcing cascades, flow dynamics). The Hawkes self-exciting process models the endogenous component by estimating a branching ratio – the share of current activity triggered by prior activity.

When endogeneity (n-star) is low, the market absorbs information in orderly fashion. Price discovery is efficient. Flow-driven amplification is minimal. Historical pattern: forward returns reflect fundamental drivers cleanly, and the base-rate LC drift (+1.02 pp mean) manifests.

When endogeneity is high, jumps breed further jumps through self-reinforcing cascades. Flow dominates information. Historical pattern: forward returns flatten as flow dynamics mask underlying fundamentals. The market is in a "chaotic" regime where prediction is harder.

The signal captures flow-regime, not direction. Phase –1 (Calm) is modestly bullish historically; Phase +1 (Chaotic) is modestly bearish. The empirical directional edge is modest, but the regime read is informative.

This signal is DISTINCT from all other LC signals in the stack:

- Fundamental supply signals (LC-corn ratio, cattle inventory, placements) read economic structure.
- Term structure, CFTC positioning read price-based consensus.
- Z32615 reads MARKET MICROSTRUCTURE – the flow-regime context.

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.

Phase plus 1 (Chaotic Regime, composite greater than plus 0.3) covers 3,159 trading days – 34.9 percent of the sample. Per-day mean fwd60d is plus 0.82 percent, hit rate 55 percent. Edge below baseline: minus 0.20 pp.

Phase 0 (Normal, composite between plus and minus 0.3) covers 1,876 trading days – 20.7 percent of the sample. Mean fwd60d is plus 0.52 percent, hit rate 54 percent. Edge below baseline: minus 0.50 pp.

Phase minus 1 (Calm Regime, composite less than minus 0.3) covers 4,014 trading days – 44.4 percent of the sample. Per-day mean fwd60d is plus 1.42 percent, hit rate 61 percent. Edge above baseline: plus 0.40 pp.

The directional spread is modest (+0.40 pp vs –0.20 pp) but the regime indication is clear: calm markets reward fundamental signals; chaotic markets dampen them.

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Three cases that frame how to read this signal

Case 1: September 2019. Calm Regime – pre-ASF quiet market.

Firing date: September 9, 2019 at composite −0.9995. Forward 60-day LC return: plus 27.97 percent (from $94.20 to $120.57).

Context: LC microstructure was deeply quiet in late Q3 2019 as the pre-ASF protein rebalancing proceeded in orderly fashion. The calm regime amplified the fundamental demand-pull transmission. Live cattle rallied 28 percent as the quiet market absorbed fundamentals cleanly. Canonical Calm Regime anchor.

Case 2: September 2008. Chaotic Regime – financial crisis.

Firing date: September 8, 2008 at composite plus 0.82. Forward 60-day LC return: minus 18.15 percent (from $103.05 to $84.35).

Context: LC jump-cluster intensity spiked as the Lehman shock triggered cross-asset volatility clustering through September-October 2008. The chaotic flow regime dominated fundamental drivers. Live cattle fell 18 percent as cascade dynamics amplified selling. Canonical Chaotic Regime anchor.

Case 3: October 2016. Calm Regime – Q4 2016 quiet rally.

Firing date: October 13, 2016 at composite minus 0.94. Forward 60-day LC return: plus 26.55 percent (from $94.45 to $119.52).

Context: LC microstructure was deeply quiet in October 2016 as the cycle began tightening. The calm regime enabled fundamental signals to transmit cleanly. Forward LC rallied 27 percent. Modern-era Calm Regime anchor.

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How to use the signal today

As of November 1, 2026, the composite reads minus 0.581 – Calm Regime moderate-negative firing at the EXTREME NEG threshold, 45 trading days running. LC jump-cluster intensity has moderated below the 2-year baseline. CME Live Cattle trades the $220-230 range.

The current reading is in the Phase −1 band (below −0.3) near the EXTREME NEG sub-band (near −0.5). Historical Phase −1 delivers +0.40 pp above baseline at 61 percent hit rate.

Pair with four confirming reads:

- **LC-Corn Ratio Signal (Z15201)**. Grade A LC fundamental anchor.
- **LC Term Structure Curve (Z3260)**. Strongest-IC directional signal.
- **LC Cattle Inventory Semi-Annual (Z15208)**. Longest-lead structural supply.
- **LC CFTC Positioning (Z15206)**. Positioning overlay.

Hawkes jump-cluster is a market-microstructure overlay. In calm regimes (current state), fundamental signals have cleaner transmission to forward returns. Use calm-regime periods as higher-conviction windows for fundamental positioning.

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Methodology notes

Data source. CME Live Cattle back-adjusted continuous daily returns (LC20040BD).

Signal construction. Rolling Hawkes-style jump-cluster intensity estimated via Truth LC_T050 methodology with target branching ratio n-star equals 0.636. Jump detection via bi-power variation and threshold tests. Composite = tanh of z-scored jump intensity. Z-score on 504-day rolling window. 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 −0.059 at p < 1e-7 (n = 9,049) – significant daily. Phase −1 (Calm) per-day mean fwd60d plus 1.42 percent (+0.40 pp above baseline). Phase +1 (Chaotic) per-day mean plus 0.82 percent (-0.20 pp below baseline).

Independence test. Non-overlapping (every-60d) sampling yields Spearman IC −0.157 at p-value 0.055 across 150 independent observations – BORDERLINE significant.

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What this signal does not cover

First, the signal reads flow-regime context, not direction. Phase −1 is modestly bullish and Phase +1 is modestly bearish, but the primary interpretation is regime (calm vs chaotic), not forward-return prediction.

Second, non-overlap test is borderline (p=0.055) – just above the conventional 0.05 threshold. Daily significance is partly autocorrelation-inflated through multi-week microstructure persistence.

Third, Hawkes endogeneity estimates depend on jump-detection methodology (bi-power variation thresholds, lambda parameters). The parameter choice introduces specification sensitivity.

Broader caveat: Grade B market-microstructure overlay. The signal reads WHEN fundamental signals have clean transmission (calm regime) vs WHEN flow dominates (chaotic regime). Use alongside the fundamental stack.

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: CME Live Cattle back-adjusted continuous (LC20040BD) daily returns. State-conditional statistics computed through 2026-10-30.