The FC TX Panhandle Polar Vortex Event Signal, Grade A Event-Detector with Second-Strongest IC in the FC Library

Why the Texas Panhandle plus Oklahoma plus Kansas calf-source belt polar-vortex event detector is a Grade A directional signal with the second-strongest IC in the FC library after the US Herd Inventory anchor.

David Stendahl · Market Lab Analytics · November 1, 2026

The signal and why it matters today

The Texas Panhandle, Oklahoma, and Kansas form the largest calf-source belt in the United States. This event detector fires when mean minimum temperature drops below 10 degrees Fahrenheit across this belt – a signature of polar vortex intrusions. Cold events cause calf death-loss and winter wheat pasture kill, which tightens forward feeder supply over the subsequent 60 to 90 days.

The mechanism: when a polar vortex drops TMIN below 10 F in the calf-source belt, cow-calf operators lose newborn calves to cold exposure and winter wheat pasture carrying capacity is damaged. The feeder supply tightens through the pipeline over 60-90 days as the lost calves fail to reach feedlot placement age. Historical event firings have been bullish-FC.

Daily Spearman IC against FC fwd60d is plus 0.303 at p-value less than 1e-88 across 4,172 observations – the second-strongest IC in the FC library after the US Herd Inventory anchor. Non-overlapping (every-60-day) IC is plus 0.367 at p-value 0.002 across 70 independent samples – INDEPENDENTLY SIGNIFICANT.

Phase +1 (polar vortex event firing) delivers plus 3.81 percent fwd60d at 69 percent hit rate, plus 1.73 pp above the plus 2.09 percent baseline. The signal is highly event-driven – 97.7 percent of the sample is Phase 0 (no event). When Phase +1 fires, the forward return is strongly bullish-FC.

Current reading: Normal regime at composite 0.000, 188 trading days since the last event firing (February 2026). The signal is DORMANT. Watch for TMIN drops below 10 F across the Panhandle-OK-KS belt as the trigger.

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How the polar vortex mechanism composes

The Texas Panhandle, Oklahoma, and Kansas together produce the largest share of US feeder cattle supply. Cow-calf operations in this belt generate newborn calves through the winter and early spring. These calves will become feeder-cattle market inventory 6 to 12 months later.

Polar Vortex Event (positive composite, Phase +1) means mean TMIN across the belt has dropped below 10 degrees Fahrenheit. This cold event causes:

- Calf death-loss as newborn calves cannot survive the cold exposure
- Winter wheat pasture kill as cold damages the growing crop and reduces grazing carrying capacity
- Breeding-cow stress that can delay next-year calf production
- Short-term feedlot-pipeline disruption as cattle movements slow

All of these effects tighten forward feeder supply through the pipeline over 60 to 90 days. Historical pattern: Phase +1 delivers plus 1.73 pp above baseline, 69 percent hit rate.

Normal regime (Phase 0) means no cold event is active. The signal is DORMANT in Phase 0 – 97.7 percent of the sample is in this band. Historical pattern: near baseline.

The engine applies a 10-day linear decay post-event so that the signal captures the 2-week window during which the market absorbs the news and adjusts forward feeder-supply expectations.

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What the state-conditional returns have actually done

> **Reference baseline – FC fwd60d (unconditional)**
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> CME Feeder Cattle back-adjusted continuous (FC_110ARD) forward-60-day return baseline over the live-signal window: mean plus 2.09 percent, median plus 2.60 percent, standard deviation 7.5 percent, percent negative 40 percent. Sample window 2010-01-11 through 2026-10-30, 4,172 trading days with observable fwd60d.

Per-day sampling (used for daily Spearman IC):

Phase plus 1 (Polar Vortex Event, composite greater than plus 0.3) covers 96 trading days – 2.3 percent of the sample. Per-day mean fwd60d is plus 3.81 percent, hit rate 69 percent. OUTPERFORMS baseline by plus 1.73 pp.

Phase 0 (Normal, composite near zero) covers 4,076 trading days – 97.7 percent of the sample. Per-day mean fwd60d is plus 2.05 percent, hit rate 59 percent. Near baseline (minus 0.04 pp).

Phase minus 1 (Warm Event, composite less than minus 0.3) does NOT fire in the sample. The engine does not emit a bearish-FC lean in warm conditions – warm periods are rolled into Phase 0 Normal.

Event-driven asymmetric pattern: Phase +1 provides a strong bullish-FC lean when firing; Phase 0 is near-neutral; Phase –1 does not fire. Signal is DORMANT most of the time.

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Three cases that frame how to read this signal

Case 1: February 2021. Polar Vortex Event – Texas Freeze.

Firing date: February 15, 2021 at composite near plus 0.95. Context: Catastrophic Texas Freeze dropped TMIN below 10 F across the Panhandle, OK, and KS calf-source belt. Significant calf death-loss and winter wheat pasture kill. Feeder cattle were at approximately 135 dollars. Forward FC rallied through Q2 2021 as feeder supply tightened through the pipeline. Canonical Polar Vortex Event bullish-FC anchor.

Case 2: January 2024. Polar Vortex Event – Q1 Arctic blast.

Firing date: January 15, 2024 at composite near plus 0.80. Context: Arctic blast dropped TMIN below 10 F across the Panhandle-OK-KS belt. Calf death-loss and pasture damage. Feeder cattle were at approximately 220 dollars. Forward FC rallied through Q1-Q2 2024 to near 240 dollars. Modern-era Polar Vortex Event bullish-FC anchor.

Case 3: February 2026. Most recent event firing.

Firing date: February 3, 2026 at composite near plus 0.80. Context: Polar vortex intrusion dropped TMIN below 10 F briefly. Last Phase +1 firing before the current dormant period. Forward FC through Q2 2026 was supportive. The signal has been in Normal regime for 188 trading days since.

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How to use the signal today

As of November 1, 2026, the composite reads 0.000 – Normal regime, 188 trading days since the last event firing. No polar vortex event is firing. CME Feeder Cattle trades the 330 to 340 dollar range.

The signal is DORMANT in the Normal band. No directional lean. The event detector is waiting for the next TMIN drop below 10 F across the Panhandle-OK-KS belt.

Pair with four confirming reads for direction:

- **FC US Herd Inventory Signal (Z6637)**. Strongest-IC structural supply anchor.
- **FC Light Placement Pace Signal (Z3769)**. Grade A with widest spread in FC library.
- **FC Term Structure Curve Signal (Z3302)**. Market consensus on forward FC supply.
- **LC-Corn Ratio Signal (Z15201)**. Grade A LC fundamental anchor.

When a polar vortex event fires AND structural supply is tight (Z6637 showing Small Herd Phase –1) AND placement pace is quiet (Z3769 showing Low Placements Phase –1), direction becomes high-conviction bullish-FC. The event detector is the TACTICAL layer on top of the structural supply picture.

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Methodology notes

Data source. Daily TMIN temperature readings from Texas Panhandle, Oklahoma, and Kansas weather stations in the calf-source belt. Weather data sources include USDA NWS stations and private weather providers.

Signal construction. Compute mean TMIN across the belt. Fire an event when mean TMIN drops below 10 degrees Fahrenheit. Event intensity is tanh-scaled and decays linearly over 10 trading days

post-event. State thresholds plus or minus 0.2 (moderate) and plus or minus 0.5 (extreme). Phase +1 at composite above +0.3 (event firing or recently fired). Phase –1 (warm event) does not fire in sample. Target: CME Feeder Cattle back-adjusted continuous (FC_110ARD). Daily release.

Validation statistics. Daily Spearman IC against FC fwd60d is plus 0.303 at p-value less than 1e-88 across 4,172 observations – second-strongest IC in the FC library. Phase +1 per-day mean fwd60d plus 3.81 percent (plus 1.73 pp above plus 2.09 percent baseline, hit 69 percent). Phase 0 mean plus 2.05 percent (near baseline).

Independence test. Non-overlapping (every-60d) sampling yields Spearman IC plus 0.367 at p-value 0.002 across 70 independent observations – INDEPENDENTLY SIGNIFICANT. The sample is small (n=70) because the signal has 17-year history, but the IC is high enough that the significance holds.

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What this signal does not cover

First, event-driven asymmetry means the signal is dormant most of the time. 97.7 percent of trading days are Phase 0 Normal. Actionable reads come only during polar vortex events – 2.3 percent of trading days. The signal is a TACTICAL layer, not a persistent directional lean.

Second, Phase –1 (Warm Event) does NOT fire in the sample. The signal does not provide a bearish-FC lean in warm conditions. Winter warm spells are rolled into Phase 0 Normal rather than firing a bearish band.

Third, the detector uses mean TMIN below 10 F across the belt as the trigger. Localized cold events that affect subregions may not trigger the belt-wide mean. The signal captures BELT-WIDE polar vortex intrusions, not localized cold snaps.

Broader caveat: Grade A directional event-detector signal with the second-strongest IC in the FC library after the US Herd Inventory anchor. The signal provides a high-conviction tactical lean when Phase +1 fires. Pair with structural supply and placement signals for stacked confirmation on direction and conviction.

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: Daily TMIN temperature from TX Panhandle plus OK plus KS calf-source belt weather stations; CME Feeder Cattle back-adjusted continuous (FC_110ARD). State-conditional statistics computed through 2026-10-30.