Three Physical Levers of US Pork Supply

A daily three-input playbook that blends the CME Lean Hogs futures curve, the hog-corn feed margin, and the Canadian feeder-pig flow into a single number, benchmarked against the back-adjusted tradable return a real futures trader would own.

David Stendahl · Market Lab Analytics · October 30, 2026

A three-lever playbook on US pork supply

Think of US pork supply as a system with three physical levers. The first is the shape of the CME Lean Hogs futures curve — whether the market is paying up for front-month pork or for pork one contract out, roughly four to nine weeks forward depending on where we are in the bi-monthly LH expiry cycle. The second is the hog-to-corn price ratio — a proxy for feeding margins, which drive the producer herd-expansion and liquidation cycles. The third is the Canadian border — the year-over-year change in Canadian live-swine imports from Manitoba into US finishing yards, which runs on a five-to-six-month lag to the US slaughter mix.

Each lever reads a different physical axis. The curve is market structure. The margin is economics. The border is a five-to-six-month supply pipeline. These are not three flavors of the same signal — they are three fundamentally different things that happen to all live under the same umbrella called "US pork supply." The composite blends them at 50 percent curve, 28 percent feed margin, 22 percent border, with the anchor and feed margin carrying polarity minus one (so wide contango and wide margins both read bearish forward Lean Hogs, which is the empirical direction).

Today the composite reads minus 0.60 — STRONG BEARISH, one trading day in. The curve is in deep contango and reading bearish through its 50 percent anchor. The hog-corn margin is wide and reading bearish through the polarity on its 28 percent weight. The Canadian border is quiet near zero. Two of the three inputs are decisively aligned to the bearish side. This is the kind of day the playbook is designed to size on.

• • •

Three cases that frame how to read this playbook

The honest way to teach a composite is to walk through specific moments when it fired a tail and show what happened next on the Lean Hogs tape. Three cases below, benchmarked against the back-adjusted tradable return, not nominal front-nearby.

Case 1: STRONG BEARISH firing on wide contango plus wide margin alignment

A representative STRONG BEARISH entry occurs when the futures curve pushes deep into contango and the hog-corn margin is simultaneously wide. The two 78-percent-weighted inputs roll in the same bearish direction at the same session. The following 60 trading days have historically delivered a negative tradable return on CME Lean Hogs consistent with the STRONG BEARISH band mean of minus 4.4 percent. This is the pattern the playbook is designed to catch: not just one tail reading, but two large uncorrelated inputs flipping the same way.

Case 2: STRONG BULLISH firing on compressed curve and compressed margin

A representative STRONG BULLISH entry occurs when the curve backs off wide contango toward backwardation and the hog-corn margin tightens simultaneously. The polarity flips on the two largest inputs produce an aligned bullish composite above the plus 0.5 threshold. The following 60 trading days have historically delivered a positive tradable return consistent with the STRONG BULLISH band mean of plus 3.1 percent. The border input is quiet in both cases, which is typical — the Canadian flow is a diversifier, not usually a tail driver.

Case 3: a tail reading that did not pay off

A honest counter-example occurs when the composite crosses a threshold on thin alignment — one strong input and two weaker ones. The composite still crosses but on a two-of-three or weaker setup rather than a clean three-of-three alignment. The forward 60-day Lean Hogs return comes back flat or against the band. The lesson is in the composite's design: the historical edge comes from the quality of the agreement between inputs, not from the composite crossing a threshold alone. A tail reading on weak alignment is a weaker signal than the same reading on strong alignment.

• • •

What the state-conditional firings have actually done

The composite partitions into five bands against the CSI tradable LH21260BD back-adjusted series (CLAUDE.md Rule 0 canonical benchmark). Baseline unconditional Lean Hogs forward 60-day return is plus 0.05 percent mean and minus 0.58 percent median across 8,990 aligned observations from 1990 forward.

> **Composite forward 60-day tradable return by band (baseline mean +0.05 percent, median −0.58 percent)**
>
> STRONG BULLISH (10.6 percent of trading days): mean +3.10 percent, edge +3.05 pp above baseline.
> BULLISH (19.1 percent): mean +0.95 percent, edge +0.90 pp.
> NEUTRAL (41.8 percent): mean −0.32 percent, edge −0.37 pp.
> BEARISH (22.6 percent): mean −2.60 percent, edge −2.66 pp.
> STRONG BEARISH (5.9 percent) — today's state: mean −4.38 percent, edge −4.43 pp.

Spearman rank information coefficient across the full sample is plus 0.156 at the 60-day horizon with p-value effectively zero. That is not a huge aggregate edge — it is a composite that earns its weight at the tails. The spread between the STRONG BULLISH and STRONG BEARISH bands is about 7.5 percentage points, modest but real and consistent across walk-forward time slices from 1990 forward.

• • •

How the inputs compose

Three members, three different data cadences, three different time horizons.

The front-second basis (50 percent anchor weight, polarity minus one) reads the daily settlement of the front-month and second-month CME Lean Hogs futures contracts. The gap between them, standardized and bounded, measures curve shape. Wide contango reads bearish on the empirical fit against tradable returns.

The hog-corn ratio (28 percent weight, polarity minus one) reads the daily ratio of CME Lean Hogs to CBOT corn futures. Wide margins trigger producer herd retention and liquidation discipline, which drives near-term bearish Lean Hogs through supply timing. The polarity flip reflects the empirical result that favorable margins reliably precede bearish forward returns in the 60-day window.

The Canadian feeder pigs signal (22 percent weight, polarity plus one) reads the year-over-year change in Canadian live-swine imports via USDA Economic Research Service data. Collapsing imports read bullish Lean Hogs; surging imports read bearish, on a five-to-six-month biological supply pipeline from Manitoba weanling to US finished hog.

The composite applies each member's weight and polarity, sums the contributions, and bounds at plus or minus one. Today's arithmetic: 0.628 x 0.50 x –1 equals –0.314 (basis), 0.985 x 0.28 x –1 equals –0.276 (feed margin), –0.044 x 0.22 x +1 equals –0.010 (border). Total minus 0.600, deep in STRONG BEARISH.

A note on benchmark. Earlier builds measured forward returns against nominal front-nearby Lean Hogs, which includes contract roll gaps as spurious returns of 10 to 30 percent every two months. Those gaps inflated tail-band statistics by roughly ten times. The current build benchmarks against the CSI tradable back-adjusted additive-correct series — the price series a rolling Lean Hogs position actually experiences. The numbers came down from inflated to honest; the direction of the signal and its statistical significance survived.

• • •

How to use this playbook today

At the tails as a sized directional read. In the middle as a watch indicator.

Today the composite is at minus 0.60, STRONG BEARISH, one trading day in. Historically days this negative have preceded an average forward 60-day Lean Hogs tradable return of minus 4.38 percent, roughly 4.4 percentage points below the baseline mean of plus 0.05 percent. The composite is giving a sized bearish signal with real alignment: two of three inputs (the anchor and the second-largest) are both reading bearish at the same session, which is the setup the playbook is designed to catch.

If your own view on Lean Hogs is coming from slaughter counts, cold storage, basis, or seasonality and it is also bearish, the composite is confirming. If your view is bullish, the composite is actively disagreeing through 78 percent of its weight, and the disagreement is coming from an aligned supply story: comfortable curve plus expansion-signaling feed margin. The playbook does not tell you to abandon your view; it tells you to size appropriately given that most of the composite is pulling the other way.

Watch over the coming days whether the curve stays in wide contango and the feed margin stays wide. If either compresses toward neutral, the composite will moderate back toward the middle and the sized bearish lean fades. If both hold, the lean persists.

• • •

Methodology notes

The composite benchmarks against the CSI tradable LH21260BD back-adjusted continuous CME Lean Hogs series. The adjustment is additive, so the correct percent-return formula per CLAUDE.md Rule 0 and the DATA_INVENTORY documentation is close.diff divided by unadjusted-close one-day lag — not naive close pct-change. The resulting daily returns compound into a tradable cumulative-return index that measures what a rolling Lean Hogs position actually earns.

Member engine details. The basis signal standardizes the front-second curve spread on a trailing 504-trading-day window with a 126-day minimum and applies hyperbolic tangent bounding. The hog-corn ratio computes directly from CME Lean Hogs and CBOT corn front-month settlements, z-scores on a trailing five-year window, bounds. The Canadian feeder-pigs signal reads monthly USDA ERS Canadian live-swine import counts, computes year-over-year change, z-scores against the trailing distribution, inverts the sign so collapsing imports read positive (bullish forward Lean Hogs), bounds. Each member's output is then weighted and polarity-adjusted inside the composite.

Scorecard against the tradable benchmark returns PRED grade B (Spearman IC plus 0.156 at 60 days, p-value effectively zero across 8,990 observations), REGIME grade A (clean 7.5 percentage-point tail spread, consistent across sub-samples), STAB grade A (coefficient sign and magnitude hold across walk-forward slices from 1990 forward). The composite earns a sized role when it reaches a tail. In the middle, it is a watch indicator with low standalone edge.

• • •

What this playbook does not cover

Four caveats on the composite's reach.

First, middle-band edge is small. The composite's big historical edges come when it reaches the STRONG BULLISH or STRONG BEARISH band. In the NEUTRAL middle, which is a correct and common resting state, the forward edge over baseline is small. Readers expecting a sized directional call every day will be disappointed; the playbook is honest about the middle being a watch state.

Second, weights are static. The 50 / 28 / 22 weighting is fixed. In a regime where the feed-margin cycle is dominating pork supply more than curve-shape dynamics, the composite's 28 percent weight on the feed margin may underweight the actual information content for that period, and the composite may lag until the regime stabilizes.

Third, monthly data in a daily composite. The Canadian feeder-pig input updates on a monthly USDA cadence, which means the daily composite's border contribution is stepped — flat for roughly three weeks, then jumps on the release day. Day-to-day composite movement comes almost entirely from the daily inputs (basis, feed margin) between USDA releases.

Fourth, does not replace a trader's own judgment. The composite is a sized directional read when it reaches a tail, and a watch indicator in the middle. It is not a stop-loss, not a position-sizing engine, not a complete trading system.

Not investment advice. Hypothetical back-tested results have inherent limitations including no actual trading risk and the benefit of hindsight. Past performance does not guarantee future returns. Readers should consult a licensed investment professional before acting on anything in this brief.