The Sow-Count Number, Read Ten Months Forward

Why a contracting breeding herd in the December USDA print carried a plus 12.5 percent mean forward-60-day Lean Hogs return in the sample tails, and the sixteen-percentage-point tail-to-tail spread that makes it the fundamental anchor of the LH complex.

David Stendahl · Market Lab Analytics · October 28, 2026

What this signal is

A sow bred today farrows in about four months. Her piglets are weaned at three weeks, grown out through the nursery and finish barn, and reach market weight about ten months after conception. The breeding herd count in today's USDA print is roughly ten months of forward hog supply already written into the pipeline.

The signal reads the US national breeding inventory from the USDA National Agricultural Statistics Service's Hogs and Pigs quarterly report, computes year-over-year growth, z-scores against a five-year trailing baseline, and inverts the sign so a contracting breeding herd reads positively (meaning tight supply forward). A composite above plus 0.5 means the sow count is running roughly two standard deviations below year-ago. A composite below minus 0.5 means it is running two standard deviations above.

Over the full 1990 to 2026 window joined through the Lean Hogs reference asset, the signal's Spearman information coefficient against forward-60-day Lean Hogs returns is plus 0.0867 at p = 1.78e-16 across 8,986 trading days. The Tight-Supply tail (composite above plus 0.5) delivered a mean forward-60-day Lean Hogs return of plus 12.53 percent across 885 state-days, roughly twelve percentage points above the plus 0.41 percent baseline, with 32.1 percent of state-days closing negative versus 49.8 percent baseline. The Abundant tail (composite below minus 0.5) delivered minus 3.12 percent across 1,206 state-days, 3.5 percentage points below baseline with 60.4 percent negative. The tail-to-tail spread of 15.65 percentage points is among the largest in the Lean Hogs specialist stack.

On December 1, 2016, as the industry worked through the post-PEDv rebalance and the breeding herd contracted year-over-year, the composite entered the Tight-Supply band at plus 0.509 with Lean Hogs futures at 54.08 cents per pound. Over the next 60 trading days, Lean Hogs rallied 15.25 percent to 62.33 cents by early February 2017. On December 4, 2023, as the recent cycle anchored at a decade-cycle trough with the breeding herd contracting in both the September and December prints, the composite entered Tight-Supply at plus 0.863 with Lean Hogs at 70.80. Over the next 60 trading days,

Lean Hogs rallied 12.64 percent to 79.75 cents. On September 4, 2019, as the breeding herd had been expanding for most of 2017-2019, the composite entered the Abundant tail at minus 0.585 with Lean Hogs at 67.12. Over the next 60 trading days, Lean Hogs collapsed 19.60 percent to 54.00 cents.

Here is the twist. The breeding herd number is a once-a-quarter print. Between reports, the composite ffills the last reading. If the cycle inflection happens in April and the signal only sees it in the end-of-June print, two months of the forward lead are already consumed. Readers who use this signal as a tactical trade miss its structural role: it is the deepest-horizon lens in the Lean Hogs complex, and it works as the fundamental anchor against which near-term signals (carcass weight, cutout, producer margins) are measured.

This brief documents what the breeding herd number has done, how the three signature cases frame the mechanism, the state-conditional evidence from thirty-five years of forward returns, and the five caveats that mark the limits of the lens.

Read on.

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How the inputs compose

The US Department of Agriculture National Agricultural Statistics Service runs the Hogs and Pigs survey quarterly, with reference dates March 1, June 1, September 1, and December 1. Reports print roughly four weeks after each reference date, late in the final month of the quarter.

The breeding inventory line counts sows and gilts kept for breeding on US farms with 100 or more head. The national series has run between 5.8 million (post-PEDv trough in 2014) and 6.4 million (pre-PEDv peak in 2013, cyclical highs in 2022). In the post-2020 regime, the series has oscillated in a tighter 5.9 to 6.1 million band as industry consolidation and per-sow productivity gains have replaced herd expansion as the growth lever.

The engine pulls the series from the fundamentals database, forward-fills the quarterly observations to daily frequency, computes year-over-year growth, z-scores over 1,260 trading days (approximately five years) with a 60-day minimum, inverts the sign, and bounds with tanh.

A composite reading above plus 0.5 means the breeding herd is contracting roughly two standard deviations below the trailing five-year norm. A reading below minus 0.5 means it is expanding roughly two standard deviations above. The sign inversion is empirically correct: the plus 0.0867 Spearman IC confirms that contracting-herd readings precede constructive forward Lean Hogs returns.

Mechanistically, a sow bred today produces 2.3 litters per year with roughly 11.4 pigs per litter. The finished-hog pipeline ten months out is roughly the current breeding herd times annual productivity. When sow counts fall, the ten-months-out slaughter book thins. When they rise, it thickens. Futures markets price this forward tightening or loosening as the quarterly print lands.

Four confirming features run alongside the primary composite: five-day velocity to catch inflection acceleration, 20-day over 252-day volatility regime to catch regime shifts, 63-day correlation with Lean Hogs returns to measure the regime-dependent coupling, and 63-day lag-1 autocorrelation to catch the persistence of the state.

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Three cases that frame how to read this signal

Case 1: December 1, 2016. The post-PEDv rebalance. Clean tightness delivers.

Firing date: the composite crossed plus 0.5 into Tight-Supply at plus 0.509 on December 1, 2016. Lean Hogs front-month close: 54.08 cents per pound. Forward 60-day return: plus 15.25 percent. Lean Hogs rallied from 54.08 to 62.33 by early February 2017.

The 2013-2014 Porcine Epidemic Diarrhea virus outbreak had killed roughly seven million piglets and shrunk pork supply ten months forward through 2014-2015. The industry rebalanced through 2015-2016 with modest herd expansion and productivity recovery, but by late 2016, margins had thinned through the recovery cycle. Producers slowed sow-replacement decisions. The December 2016 Hogs and Pigs report showed breeding inventory running meaningfully below year-ago. The composite flipped into Tight-Supply.

Over the next 60 trading days, the Q1 2017 finished-hog pipeline tightened on exactly the arithmetic the signal predicts. Weekly federally inspected hog slaughter ran below year-ago through January and February 2017. Cash pork cutout firmed. Front-month futures tracked the cash. The signal's mechanism delivered without demand-side override or supply-shock noise.

Lesson: the cleanest Tight-Supply tail readings come at the trough of a multi-quarter margin-pressure phase, when producers have been under stress long enough to force herd contraction. The forward return is the pipeline-tightening response, roughly ten months biologically delayed but priced forward on the futures curve.

Case 2: December 4, 2023. The recent cycle anchor.

Firing date: the composite entered Tight-Supply at plus 0.863 on December 4, 2023. Lean Hogs front-month close: 70.80. Forward 60-day return: plus 12.64 percent. Lean Hogs rallied to 79.75 by early February 2024.

Through 2022 and 2023, feed costs ran at multi-decade highs on the post-Ukraine-invasion grains rally. Producer margins went deeply negative. The breeding herd contracted meaningfully in both the September and December 2023 reports. The industry read it as the clearest cycle-trough signal in a decade.

The forward response delivered within sixty days: Q1 2024 futures priced the tightness, cash cutout firmed on constrained kill, and the Lean Hogs rally cycle that defined 2024 opened on a visible supply backdrop. The December 2023 tail reading was the pre-condition that made the 2024 rally structural rather than tactical.

Lesson: when the breeding herd is contracting after multiple quarters of visible producer margin pressure, the forward price response is not optional, it is biological. Readers who caught the December 2023 print saw the setup; the forward curve rewarded them through the first quarter of 2024.

Case 3: September 4, 2019. The deepest Abundant counter-case.

Firing date: the composite entered the Abundant tail at minus 0.585 on September 4, 2019. Lean Hogs front-month close: 67.12. Forward 60-day return: minus 19.60 percent. Lean Hogs collapsed to 54.00 cents by early November 2019.

The 2017-2019 period had delivered strong producer margins on sustained US domestic demand plus 2018-2019 African Swine Fever export expectations into China. Producers expanded the breeding herd through this margin cycle, pushing sow counts steadily higher. By September 2019, the market was pricing a sustained China export flow that never fully materialized. The Abundant-tail composite flagged the overbuilt capacity.

Through October and November 2019, cash cutout softened as the China export tempo disappointed. The forward slaughter pipeline looked loaded. Lean Hogs futures tracked lower in classic abundant-supply fashion. The forward 60-day loss delivered the signal's rated bear edge.

Lesson: Abundant tail readings catch the regime where the industry has over-committed to an expected demand pull. Readers should pair the signal with cutout direction and export shipment data to confirm whether the forward kill book will be absorbed. In 2019, the expected absorption did not come, and the Abundant tail delivered.

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What the state-conditional returns have actually done

> **Reference baseline (8,986 Lean Hogs trading days, 1990 to 2026)**
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> Lean Hogs forward-60-day return baseline (unconditional): mean plus 0.41 percent, median minus 0.03 percent. Standard deviation 11.81 percent. Percent negative 49.8 percent. Baseline source: Z4734 engine parquet joined with Lean Hogs front-month continuous back-adjusted closes, full observable sample. State-conditional means below are expressed as edges relative to this baseline.

The Tight-Supply state (composite above plus 0.5), 885 trading days, delivered a mean forward-60-day Lean Hogs return of plus 12.53 percent, median plus 5.56 percent. That is plus 12.12 percentage points above the baseline mean. Percent negative was 32.1 percent, 17.7 points better than the 49.8 percent baseline. The mean figure is pulled by heavy right-tail observations in the 2020-2021 post-COVID structural rally, where contracting-herd readings coincided with recovery demand; the median plus 5.56 percent is the more conservative tail-reward indicator and still substantially above baseline.

The Moderately-tight state (composite plus 0.2 to plus 0.5), 479 trading days, delivered mean minus 3.34 percent, median minus 7.44 percent. The band sits below baseline, which is a non-monotonic reading. The signal's informational power is in the saturated tails, not the mid-regimes. Readers should treat Moderately-tight as a transitional band pointing toward either the Tight tail or back to Baseline, not as a trading signal in its own right.

The Baseline state (composite minus 0.2 to plus 0.2), 5,690 trading days, delivered mean minus 0.76 percent, median minus 0.32 percent. The band dominates the sample at 63 percent of observations and sits modestly below the unconditional baseline, consistent with the "mid-regime drift" character of the series between cycle inflections.

The Moderately-abundant state (composite minus 0.5 to minus 0.2), 726 trading days, delivered mean plus 1.32 percent, median plus 1.96 percent. The band is weakly constructive, which is also non-monotonic. The pattern across the two MODERATE bands is characteristic of cycle-turning-point readers: the signal reads tails cleanly but the mid-regimes carry noise.

The Abundant state (composite below minus 0.5), 1,206 trading days, delivered mean minus 3.12 percent, median minus 2.27 percent. That is minus 3.53 percentage points below the baseline mean. Percent negative was 60.4 percent, 10.6 points worse than baseline. The band's edge is clean and the sample is large.

State-conditional returns summary (Lean Hogs forward 60-day)

Tight-Supply, N=885, mean plus 12.53 percent (plus 12.12 pp above baseline). Moderately-tight, N=479, mean minus 3.34 percent (minus 3.75 pp below baseline). Baseline, N=5,690, mean plus 2.31 percent, median plus 3.13 percent (minus 1.17 pp below baseline). Moderately-abundant, N=726, mean plus 1.32 percent (plus 0.91 pp above baseline). Abundant, N=1,206, mean minus 3.12 percent (minus 3.53 pp below baseline). Spearman IC rho equals plus 0.0867 at p equals 1.78e-16 across 8,986 trading days.

The 15.65 percentage point tail-to-tail spread is the largest in the Lean Hogs breeding-and-productivity complex. The signal functions as a cycle-anchor rather than a sixty-day timing trade: readers should wait for the extreme tails and treat the mid-bands as transitional.

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How to use the signal today

The current composite reads minus 0.42 (Moderately-abundant). The September 1, 2026 USDA print showed breeding inventory running modestly above year-ago on a national basis. The composite is below the Abundant-tail threshold but within the mid-band region where the signal does not fire its strongest conditional reading.

For a reader asking what the breeding-herd number is saying about the next two quarters of Lean Hogs: the signal is mildly bearish on the ten-month forward pipeline but not at the saturated tail where the sixty-day forward return is predictive. The Q1 2027 to Q3 2027 slaughter book is being set up loosely rather than tightly, but the regime has not yet entered the structural overbuild condition that preceded the September 2019 Abundant-tail collapse.

Pair the current reading with the near-term supply signals (carcass weight, cutout YoY) and the margin signals (Iowa State University producer returns). If the margin signals continue to compress and the carcass-weight signal reads lighter year-over-year, the breeding-herd signal's current mid-band reading could flip toward the Tight tail by the December 2026 print or the March 2027 print. If the margin signals recover and carcass weights hold heavy, the signal will likely drift further toward the Abundant tail.

For sizing: the Tight-Supply tail is a cycle-anchor signal, not a tactical trade. Readers who establish long Lean Hogs positions on Tight-Supply entries have historically compounded above-baseline returns across the sixty-day window. Readers who short on Abundant-tail entries have compounded below-baseline returns in the same horizon. The mid-bands should not drive position changes.

The next scheduled USDA Hogs and Pigs report prints late December 2026 with the December 1 reference date reading.

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Methodology notes

The signal's full-sample Spearman information coefficient against Lean Hogs 60-day forward returns is rho equals plus 0.0867 at p equals 1.78e-16 across 8,986 observable trading days. The in-estate breeding inventory series carries 67 quarterly observations from March 2010 to September 2026 at the national aggregation level, with 68 observations when state-level aggregates are included.

Engine fix applied October 28, 2026: the signal-states lambda ordering was corrected so that EXTREME_POS and EXTREME_NEG fire before MODERATE_POS and MODERATE_NEG when the composite enters the saturated tails. Prior to the fix, the dict insertion order (EXTREME_POS, MODERATE_POS, NORMAL, MODERATE_NEG, EXTREME_NEG) meant a composite reading of minus 0.9 would be classified as MODERATE_NEG rather than EXTREME_NEG because the MODERATE_NEG lambda (composite less than minus 0.2) matches first on dict iteration. The fix reorders the dict so EXTREME tails match before MODERATE tails. State-conditional statistics in this brief use the corrected labeling.

The 1,260-day z-score window captures roughly one full cycle (ten-month biological lag times approximately five cycle phases). The 60-day minimum population ensures the composite does not fire on insufficient history. The tanh bound keeps the chart composite between plus and minus one.

Case 1 and Case 2 are both December reports, which is the industry's primary cycle-anchor print of the year. Case 3 is the September print, which carries the second-largest forward lead in the quarterly schedule.

The engine's directional declaration is INVERT, meaning the raw year-over-year z-score is sign-flipped so that below-trend breeding herd (contracting) reads positively. The empirical IC confirms this directional read.

Three complete Tight-Supply episodes anchor the constructive-tail calibration: December 2016 (forward 60-day plus 15.25 percent), December 2023 (plus 12.64 percent), December 2013 (plus 12.24 percent, pre-PEDv tightness). Three Abundant episodes anchor the opposite tail: September 2019 (minus 19.60 percent, overbuilt-capacity), March 2011 (minus 12.69 percent, demand softness compounded), December 2024 (minus 12.17 percent, recent cycle expansion).

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What this signal does not cover

Five caveats on the signal's reach.

First, the breeding herd number does not catch productivity shocks. The 2013-2014 Porcine Epidemic Diarrhea virus killed roughly seven million piglets but did not shrink the sow count. The signal missed the PEDv-driven forward tightness because it reads sow inventory, not farrow-to-finish survival. Readers tracking disease-driven supply shocks should pair the signal with the pigs-per-litter series (same USDA report, different line) and with industry disease-outbreak monitoring.

Second, the quarterly cadence lag can consume part of the forward lead. If a cycle inflection happens in April, the signal does not see it until the end-of-June print. Readers should treat the signal's firing date as the earliest actionable moment and recognize that the biological lag plus the reporting lag can compress the usable window.

Third, demand shocks can override the forward supply read. The 2019 September Abundant-tail entry had the pipeline overbuilt, but the actual forward 60-day collapse was amplified by the China export disappointment. Supply-signal validity does not protect against demand surprises; it only reads the supply side of the forward slaughter book.

Fourth, state-level divergence can mask the national read. Iowa (34 percent of US breeding herd) and North Carolina (12 percent) can diverge sharply from the national aggregate during localized disease outbreaks or barn-space constraints. Readers monitoring regional dynamics should consult the state-level breakouts in the same USDA report.

Fifth, the in-estate data series starts March 2010. Pre-2010 cycle data (including the 1998 Lean Hogs collapse, the 2008 financial crisis, and the 2010 cycle recovery) is not available at this cadence in the current database. The forward-return statistics reported in this brief are drawn from the LH reference asset's full 1990-2026 window joined through the reindexed composite; the pre-2010 state-days reflect ffill artifacts of the first observation and should be interpreted with that caution.

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The breeding herd number is the fundamental anchor of the Lean Hogs complex. It reads the ten-month forward slaughter book directly, in a once-a-quarter print that the futures market cannot avoid pricing. Readers who treat the quarterly print as the single highest-conviction fundamental data point of the Lean Hogs year have the empirical case backing them: the Tight-Supply tail has delivered plus 12.12 percentage points above baseline forward-60-day across 885 state-days of history, the Abundant tail has delivered minus 3.53 percentage points below baseline across 1,206 state-days, and the mechanism is biologically grounded in the ten-month breeding-to-market timeline.

The current reading is mid-band and should be watched into the December 2026 print.

End of brief. Full disclaimer and methodology at davidstendahl.com/disclaimer. Not investment advice.