Hay price volatility and forage supply insecurity in the American West

Drought, snowpack decline, and structural risk to livestock operations

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Abstract

Livestock producers across the American West face an intensifying convergence of climate, hydrological, and logistical pressures that are fundamentally undermining the reliability of conventional hay supply chains. Drought conditions, record-low snowpack in the Colorado River Basin, and elevated freight costs have produced extreme swings in forage availability and price over the past four years. These conditions have contributed to a contraction in the United States cattle herd to its smallest point in more than 70 years, forced wide-scale herd culling, and placed generational ranch operations at acute financial risk. This article reviews the current state of hay price volatility and forage supply insecurity, examines the structural drivers underlying these dynamics, and considers the implications for livestock producers seeking to insulate their operations from future disruption.

Introduction

Feed supply security has become one of the defining challenges of contemporary livestock production in the western United States. For most of the twentieth century, ranchers could rely on a reasonably stable and regionally abundant hay market to supplement pasture forage. That assumption is now under serious strain. A multi-year drought cycle, diminishing mountain snowpack, and rising logistics costs have produced a feed environment characterized by acute price volatility, regional shortfalls, and increasing unpredictability.

The consequences are visible at the herd level. As of January 2025, the United States cattle herd had shrunk to 86.7 million head, the smallest inventory recorded in 74 years (USDA Economic Research Service, 2025). Producers across the West have faced a stark and painful choice: import hay at extraordinary cost, draw down feed reserves built for other purposes, or reduce herd size. Many have done all three.

This article examines the structural causes of hay price volatility, the role of snowpack decline in amplifying forage supply risk, the compounding effect of freight cost increases, and the livestock sector consequences that follow. It draws on federal agricultural data, regional climate records, and industry reporting to provide a grounded account of a crisis that is no longer episodic in character but increasingly structural.

Hay price dynamics: volatility and structural shift

Hay price behavior over the past five years reflects a market that has transitioned from cyclical variability to structural instability. The United States average price for all alfalfa hay peaked in 2022 and the first half of 2023 at historically elevated levels before softening through 2024 and into 2025 as production recovered in parts of the country (Ag Proud, 2025). However, the national average figures obscure profound regional divergences that are more consequential for individual operators.

In drought-affected regions of Colorado, for example, hay prices that had historically traded between $150 and $180 per ton were reported as high as $300 to $400 per ton during severe drought periods (WesternSlopeNow, 2025). For cow-calf operations already paying $90 to $150 per head per month in hay costs, compared to $25 to $35 per head per month on pasture, the economics of maintaining full herd size became untenable for many producers (Durango Herald, 2024). This represents a cost differential of approximately 150 percent above baseline.

The 2024 national hay production figure of 122.5 million tons, up 3 percent year-over-year, provided temporary relief in well-watered states. However, alfalfa hay acreage under drought conditions peaked at approximately 67 percent in October 2024 before declining to 51 percent by year's end, with severe drought conditions persisting into 2025 across Arizona, southern California, Montana, Nebraska, the Dakotas, Texas, and Wyoming (Ag Proud, 2025). Analysts at Terrain (2025) note that hay prices declined on a year-over-year basis for 25 consecutive months through mid-2025, reflecting national inventory recovery, but cautioned that this national trend belies ongoing regional vulnerability, particularly in drought-exposed western and southwestern states.

In many states, increased hay supplies are providing more management flexibility for cattle producers and lower hay costs are reducing annual cost of production" — USDA, via Terrain (2025). The operative word is 'many.' For producers in the most drought-affected regions, the relief has not arrived.

What the aggregate price data does not capture is the variability of hay quality across cuttings, suppliers, and delivery origins. When drought reduces local production and forces operators to source hay from distant markets, the predictability of nutritional content declines alongside the affordability of the product. Producers and their nutritionists face the compounding challenge of adapting rations not only to higher costs but to inconsistent feed value across supply sources.

Snowpack decline and the hydrology of feed insecurity

The most significant structural driver of western hay market instability is the long-term decline in mountain snowpack. Approximately 85 to 95 percent of the water supply in the Colorado River Basin originates from upper basin snowpack (Colorado Sun, 2025). That snowpack is the source of irrigation water for hay-producing regions across the West, and its decline is eroding the productive foundation of the regional forage supply.

As of early 2025, snowpack in the Lower Colorado River Basin reached levels as low as 23 percent of the historical median for the period of record (Penn State Institute of Energy and the Environment, 2025). Across the San Juan and Sangre de Cristo mountain ranges of southern Colorado, multiple monitoring stations recorded their lowest or second-lowest peak snowpack values since installation in the late 1970s and early 1980s (Colorado Climate Blog, 2025). Streamflow forecasts for April through July 2025 in the Animas, San Juan, and Dolores river systems were substantially below average, with Lake Powell expected to receive less than 70 percent of its average inflow.

The winter of 2025 to 2026 has continued this pattern. Satellite observations confirmed snow-covered area across the Upper Colorado River Basin at approximately 40 percent of typical early-March coverage, the lowest level recorded since satellite measurements began in 2001 (Western Water, 2026). Several monitoring stations reported snowpack below the tenth percentile of historical records. Soil moisture deficits inherited from a warm, dry prior year further reduce the efficiency of snowmelt conversion into river flow, amplifying the effective water supply shortfall beyond what snowpack measurements alone would indicate.

The hydrological consequences are direct and proximate for hay producers. Fields left without adequate irrigation water yield less hay, at lower quality. Hay producers in some Colorado counties have predicted yield reductions of 20 to 30 percent in severe drought years, with some fields left fallow entirely as irrigation water becomes unavailable or prohibitively expensive to secure (WesternSlopeNow, 2025). These production shortfalls feed directly into local and regional price spikes, compressing the supply available to ranchers who do not produce their own hay.

The Colorado River Compact, which governs water allocation among seven states and was established in 1922, allocated more water than the river consistently delivers even under historical conditions. The combination of structural overallocation and accelerating climate-driven reductions in snowpack has produced a chronic and worsening mismatch between the water users of the basin depend upon and the water that is reliably available (Penn State Institute of Energy and the Environment, 2025). The Compact's post-2026 renegotiation represents an opportunity for reform, but also a period of heightened uncertainty that is likely to complicate long-range agricultural planning.

Logistics costs and the burden of distance

The geographic realities of western ranching mean that hay supply shortfalls in a given region cannot simply be resolved by purchasing from elsewhere without absorbing significant logistics costs. When local production declines, producers must source hay from progressively more distant markets, with freight costs that may in some cases exceed the commodity value of the feed itself.

This phenomenon is not limited to hay markets. United States trucking costs for grain routes to Pacific Northwest and Gulf port destinations increased 18 to 22 percent quarter-over-quarter in the first quarter of 2025, driven by wage increases, chassis shortages, and terminal congestion (Grain Journal, 2025). These structural cost pressures apply equally to hay freight. For ranchers moving hay from surplus production areas in the Midwest or Pacific Northwest to drought-affected operations in the intermountain West, the economics of long-haul hay purchases are increasingly unfavorable.

> *"People are having pain points this year that they hadn't necessarily had before. The affordability of hay and the logistics of transporting dry feed from far locations are becoming a burden." — Eric Gostenik, VP of Sales, EleusisFeed (2026)*

The American Farm Bureau Federation has noted that some ranchers paid record prices to bring in hay from hundreds or even thousands of miles away during recent drought years, often spending more on freight than on the feed itself (American Farm Bureau Federation, 2025). For smaller operations without the purchasing volume to negotiate favorable freight terms, these cost structures can be prohibitive. The logistics burden also reduces the predictability of delivery timing, quality control, and nutritional consistency, adding operational risk beyond the financial dimension.

Herd culling and the accumulating cost to the livestock sector

The compound effect of hay price volatility, water insecurity, and logistics costs has produced one of the most severe livestock sector contractions in recent United States history. The cattle herd has declined from a peak of 94.7 million head in 2019 to 86.7 million head as of January 2025, an 8 percent reduction representing the smallest inventory since 1951 and the outcome of six consecutive years of herd contraction driven by drought, high input costs, and unsustainable operating conditions (USDA Economic Research Service, 2025; IATP, 2025).

Oklahoma State University livestock marketing specialist Derrell Peel has estimated that even if producers began rebuilding herds now, it would take until 2029 before any measurable impact on herd size would be visible, reflecting the biological realities of cattle reproduction and the time required to develop replacement heifers (DTN, 2025).

The industry has experienced record beef prices as a consequence of supply constraint, with ground beef prices reaching historic highs in 2025, but those market gains accrue primarily to operators with animals to sell and do not compensate those who have already reduced or exited production.

Drought conditions have been implicated as a primary cause across multiple contraction cycles. A 2021 drought in the Great Plains initiated the current contraction period, which then spread to the Central and South Plains in 2022 and 2023 (IATP, 2025). Producers who sold breeding cattle to manage feed costs during those periods lost not only current production capacity but the genetics, breeding records, and reproductive performance that take years to develop. This loss cannot be repurchased simply with improved prices; it represents a destruction of productive capital that constrains the pace of any future recovery.

The impact extends beyond individual operations. Drought has affected an estimated 50 percent of all United States cattle, according to data from the National Drought Mitigation Center, leading to broad-based inventory liquidation with cascading effects on beef supply chains, packing plant utilization, and rural community economies (Rocky Mountain PBS, 2025).

The case for on-site feed production as structural resilience

Conventional approaches to feed security, including hay purchasing, commodity feed supplementation, and emergency grazing leases, share a common characteristic: they rely on external markets and supply chains that are themselves vulnerable to the same drought and logistics pressures that drive their cost. A different strategic posture is available to producers willing to invest in on-site feed production capability.

Hydroponic green fodder (HGF) systems represent one such approach. By growing fresh barley sprouts in soil-free, climate-controlled environments using less than 0.25 gallons of water per pound of fodder produced, these systems can generate a consistent, nutritious daily feed supplement entirely independent of hay markets, freight costs, and weather variability. Production costs for barley sprouts using HGF technology run between $0.05 and $0.06 per pound. The feed is produced in 7-day cycles, is delivered fresh to animals daily, and can be incorporated into existing rations at 30 to 50 percent of total feed volume, depending on species and production goals.

Feed consistency is a particularly significant benefit in environments where conventional hay supply is variable. Each cutting, supplier, field, and delivery of purchased hay may differ in protein content, dry matter percentage, and nutritional value, requiring nutritionists to regularly retest and rebalance rations. A system that produces the same living feed ingredient the same way every day of the year eliminates this variability, providing both the producer and their nutritionist with a level of predictability that conventional forage cannot match.

This is not a claim that hydroponic fodder systems eliminate the need for purchased forage; typical ration inclusion rates of 30 to 50 percent leave a meaningful portion of the animal's diet to be sourced through other channels. The value is in anchoring the ration with a reliable, cost-controlled, water-efficient ingredient that insulates operators from the most acute effects of hay price volatility and supply disruption.

Frequently asked questions

What causes hay prices to spike so dramatically during drought years?

Drought simultaneously reduces local hay production and increases demand as pasture forage becomes unavailable. Producers who cannot graze animals must purchase hay, often from distant markets, at the same time that local supply is contracting. Freight costs and competition among buyers in drought-affected regions amplify the price increase. In severe drought years in Colorado, for example, hay prices have risen from historical norms of $150 to $180 per ton to as high as $300 to $400 per ton.

How does snowpack decline affect hay production?

Approximately 85 to 95 percent of water supply in the Colorado River Basin originates from mountain snowpack. When snowpack falls below normal levels, irrigation water availability decreases, reducing hay yields and in some cases forcing fields to remain fallow. Multiple monitoring stations in the Upper Colorado River Basin recorded snowpack at or below the tenth percentile of historical records in early 2026, with some locations at their lowest values in more than four decades.

What is the current state of the United States cattle herd?

As of January 2025, the United States cattle herd stood at 86.7 million head, the smallest inventory since 1951 and the product of six consecutive years of contraction driven by drought, elevated input costs, and feed supply insecurity. Livestock analysts have estimated that even if producers begin rebuilding herds immediately, a measurable recovery in herd size would not occur until 2029.

How much more does hay-based feeding cost compared to pasture grazing?

Pasture feeding costs approximately $25 to $35 per cow per month under normal conditions. A month's worth of hay supplementation costs $90 to $150 per cow, representing an increase in overhead of approximately 150 percent. When drought forces operators to shift from grazing to full hay-based feeding, the financial impact on operating costs is immediate and substantial.

What alternatives to purchased hay can help ranchers build feed resilience?

On-site hydroponic green fodder production is an emerging option that allows operators to produce fresh barley sprouts daily in climate-controlled systems independent of hay markets and weather conditions. Typical production costs run $0.05 to $0.06 per pound, and the systems use less than 0.25 gallons of water per pound of fodder produced, making them viable in drought-affected regions. Fodder is typically incorporated at 30 to 50 percent of the total ration, reducing but not eliminating dependence on purchased forage.

Conclusion

The structural conditions driving hay price volatility in the American West are not temporary weather phenomena. They reflect a deepening and accelerating convergence of climate change, hydrological decline, and logistical fragility that shows no sign of reversal. Snowpack in the Colorado River Basin is trending downward over decades. The hay markets that depend on that water will remain exposed to supply variability and price disruption as a consequence. And the livestock operations that depend on those hay markets carry that exposure directly onto their balance sheets.

The United States cattle herd has already paid a significant portion of the price. Decades of genetic development, generational herd-building, and productive agricultural capital have been lost to herd culling decisions made under the pressure of feed scarcity. The pace of recovery will be slow; industry analysts project that the consequences of the current contraction will persist well into the latter half of this decade regardless of near-term weather improvement.

For livestock producers, the strategic imperative is feed security as infrastructure. Feed supply cannot be managed only as a purchasing decision; it must be approached as a component of operational resilience that requires investment, planning, and diversification. On-site feed production capability, whether through hydroponic fodder systems or other means, represents a meaningful hedge against the conditions that the data now shows are becoming structural features of western agriculture rather than exceptional events.

Ranchers who have spent generations building their herds deserve tools equal to the challenges they face. Feed security is one of those tools. It is practical, measurable, and available now.

Protect your herd. Produce your own feed.

EleusisFeed designs and installs hydroponic green fodder systems for ranchers, equestrian facilities, and livestock operations across North America.
400+ installations. 40 years of experience. USDA EQUIP grant-approved.

Contact us to discuss your operation:
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