Structural Collision: The Three Forces Reshaping Global Agriculture

Why Global Agriculture Faces a Generational Reset

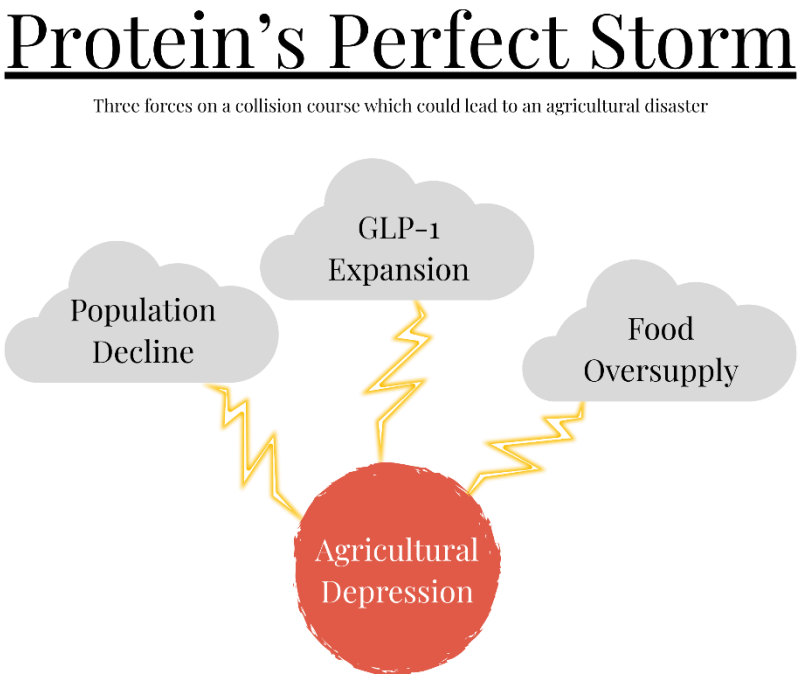

Figure 1: Storm Clouds on the Horizon

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I. PROTEIN'S PERFECT STORM

In 1919, American agriculture stood at the peak of a wartime boom. European demand had driven commodity prices to record highs, farmland values had doubled in a decade, and the future looked limitless. Within two years, farm income had collapsed 41%. By the end of the 1920s, farmland values had cratered 43%, rural banks were failing by the hundreds, and American agriculture had entered a depression that preceded the broader economic catastrophe by a full decade.

Over my 30 years in the protein industry, I have seen cyclical downturns, supply shocks, trade disruptions, and demand shifts. Every one of them resolved. The system adapted. Farmers planted different crops, processors found new markets, and the agricultural economy absorbed the blow and moved on.

What I see unfolding now is different. Three structural forces are converging on global agriculture simultaneously, and unlike cyclical disruptions, none of them will self-correct within a normal business cycle. The dominoes are ready to fall, and the current safety nets are stretched too thin. The three forces are:

1. The rapid expansion of GLP-1 weight-loss drugs and their suppression of food demand.
2. A global oversupply of grain and oilseeds that is already crushing farm-gate prices.
3. Declining global birth rates which are shrinking the consumer base in the world's most important protein markets.

Individually, each is manageable. Together, compounded by a volatile trade environment, the Make America Healthy Again policy movement, and accelerating farm consolidation, they threaten a generational reset of the agricultural economy.

The parallels to the 1920s are uncomfortable and specific. A post-crisis production boom. The loss of critical export markets. Collapsing commodity prices amid rising input costs. A farm finance system stretched to its limits. The difference is that in the 2020s, the demand side faces headwinds that the 1920s never encountered.

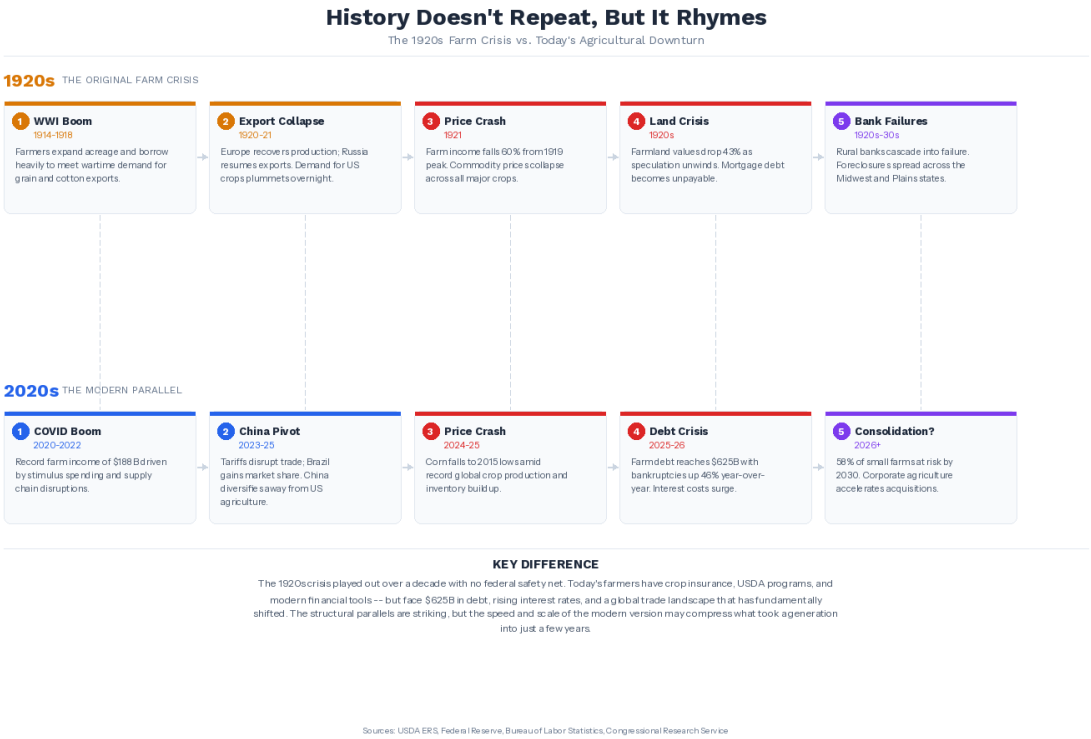

Figure 2: Historical Parallel — The 1920s Agricultural Depression and Today

II. THE FIRST FORCE: GLP-1 EXPANSION AND THE DEMAND DESTRUCTION MATH

The pharmaceutical transformation of the American appetite is no longer theoretical. One in eight U.S. adults are already using GLP-1 receptor agonist drugs such as Ozempic, Wegovy, and Mounjaro. The global GLP-1 market reached $65.8 billion in 2025 and is projected to grow at a 17.3% compound annual rate to $324.5 billion by 2035.

The Pill Changes Everything

For the first five years of the GLP-1 revolution, adoption was constrained by three practical barriers: fear of self-injection, cold-chain logistics, and limited distribution infrastructure. In December 2025, the FDA approved the first oral GLP-1 formulation (Wegovy pill) launched in January 2026. Eli Lilly's oral competitor, orforglipron, is expected to gain approval in 2026.

The pill removes every adoption barrier at once. No needles. No refrigeration. A distribution model the pharmaceutical industry perfected decades ago. This is the inflection point where GLP-1 adoption transitions from early-adopter niche to mass-market reality.

The Demand Destruction Math

The food-demand implications are grounded in peer-reviewed research, not speculation. A Cornell University study published in the Journal of Marketing Research in December 2025 found that GLP-1 households reduce grocery spending by 5.3% on average, with high-income households cutting 8% or more. Fast-food spending dropped 8%. Savory snacks fell 10%. The University of Illinois farmdoc team modeled a scenario of 10% usage among overweight and 20% usage among obese adults and projected a 3% reduction in total U.S. caloric demand, equivalent to 20 billion fewer calories consumed per day and $1.2 billion less in weekly food spending.

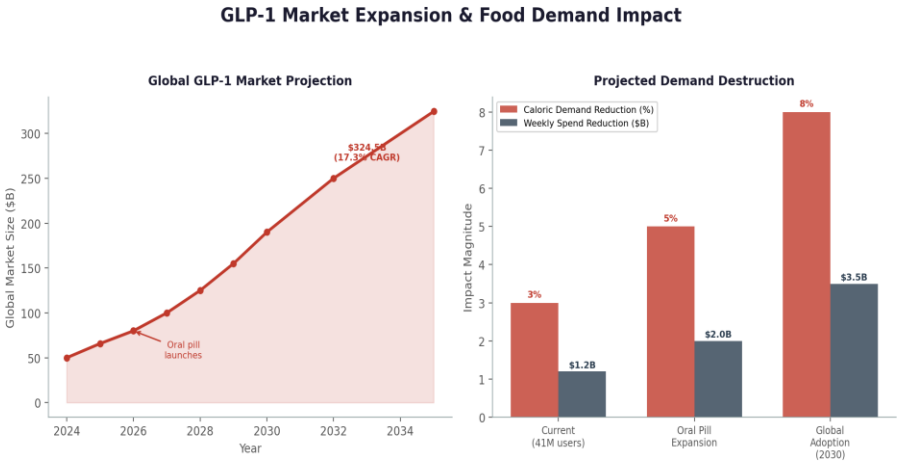

Figure 3: GLP-1 Market Expansion and Projected Demand Impact

The Arkansas Agricultural Experiment Station reported that 70% of GLP-1 users reduced processed food consumption, with calorie reduction estimated at 720 to 990 calories per day for weight-loss users. A KPMG study found caloric intake dropped 21% and monthly grocery spending fell 31% among users. Frontiers in Clinical Diabetes and Healthcare confirmed significant reductions across all macronutrient categories.

The data from GLP-1 users shows that protein consumption increases as a share of total diet. Historically, meat consumption was elastic in nature and demand shifted to less expensive options when prices surged. However, in 2025 retail beef prices hit record highs, demand continued to grow, and the food industry took action. Nestle launched its first new brand in 30 years, *Vital Pursuit*, specifically targeting GLP-1 users. General Mills and Danone are marketing high-protein, high-fiber products to this audience. Chipotle is selling a protein cup, literally just a cup of meat. Smoothie King created a "GLP-1 Support Menu." Restaurants across the country are reviewing portion sizes. These are not speculative adjustments. They are the canary in the coal mine.

The Critical Nuance

Proponents of a benign outcome note that GLP-1 users increase protein as a percentage of their total diet. This is true. But the math does not rescue aggregate protein demand. When total caloric

intake drops 20% or more, even a shift toward protein-dense foods cannot fully offset the volume decline. A person eating 1,600 calories instead of 2,200 is buying less food overall, period. Multiply that across tens of millions of users and the demand destruction isn't just a trend, it is structural.

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III. THE SECOND FORCE: GLOBAL FOOD OVERSUPPLY

While GLP-1 drugs chip away at demand from the consumer side, the supply side has been building its own crisis. The USDA's January 2026 World Agricultural Supply and Demand Estimates report confirmed what many in the industry already knew: the world has too much grain.

The Grain Glut

The 2025 U.S. corn crop came in at a record 17 billion bushels, grown on the most planted acreage since 1936. Corn ending stocks reached 2.227 billion bushels, a seven-year high. Soybean ending stocks hit 350 million bushels, a six-year high. Brazil, meanwhile, is projecting soybean production of 178 to 179 million metric tons for the 2025/26 crop year, up 4% and continuing to dominate global markets.

China: The Demand Engine Sputters

China, the world's largest agricultural importer, is pulling back across multiple categories. Chinese buyers now source 67% of their soybean imports from Brazil, up from 49% in 2024. U.S. soybean exports to China stand at just 6.6 million metric tons, 72% below their 2021 peak. China imposed a 55% tariff on beef imports exceeding quotas effective January 1, 2026, essentially cutting Brazilian beef access by more than 30%. That's not a trivial amount either, it represents 600k MT, or 1.3 billion lbs. Sometimes these numbers can have a numbing effect, so for context, the amount of Brazilian boneless beef that will hit the open market this year is 3 times the amount of boneless beef currently in US Cold Storage. Moreover, China is targeting a one-million-head sow herd reduction to address its own pork oversupply, with the national sow herd already down 6.9% year over year. Many of you reading this report likely remember the eye watering pork demand China needed after African Swine Fever decimated their herd in 2018. China is now sending signals to the global agriculture industry that they are all stocked up.

The U.S. Beef Paradox

The cattle market presents what appears to be a counternarrative but is actually a time bomb. January 2026 inventory counted 86.2 million head of total cattle, a 75-year low, with beef cows at 27.6 million head and a seventh consecutive year of declining calf crop. Tight supplies are

supporting record cattle prices today, and Rabobank projects only a modest rebuild of 500,000 head by January 2027.

Here is the paradox: this is a *lagging indicator*, not a leading one. It takes a solid three years from the moment retention starts for cattle to reach the market. The beef industry will be adding supply back into a market where demand is being structurally undermined by GLP-1 adoption, population decline, and shifting trade flows. Today's tight supply is masking tomorrow's structural imbalance. The producers who expand now based on current price signals may find themselves overcommitted as the demand floor shifts beneath them.

The Farm Economy Is Already Under Stress

The USDA's February 2026 Farm Income Forecast tells a story that the headline number obscures. Net farm income is projected at $153.4 billion, a modest 2.6% inflation-adjusted decline that sounds manageable. But strip out government payments, and the picture darkens dramatically: net farm income falls nearly 12% to $109.1 billion. Government payments are forecast at $44.3 billion for 2026, up $13.8 billion (45%) from 2025, approaching levels not seen since the COVID-era emergency disbursements.

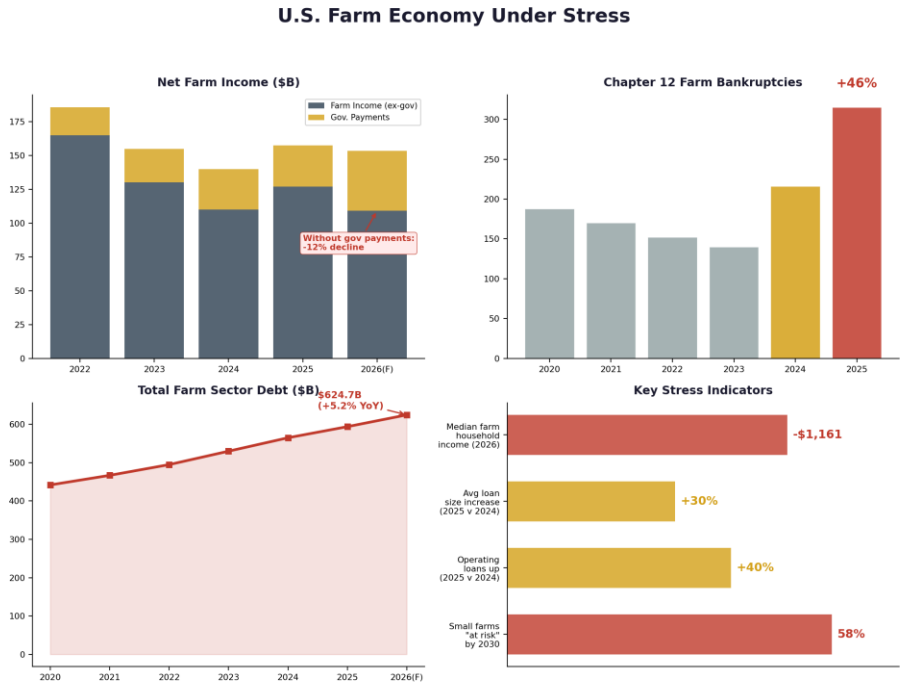

Figure 4: Farm Economy Stress Dashboard — The Numbers Behind the Headlines

That $44.3 billion in government payments is not a sign of system resilience. It is life support. And the patient's vital signs are deteriorating: median farm income for farm households is projected at negative $1,161 in 2026. Twenty-seven former USDA officials and agricultural leaders have warned of a risk of "widespread collapse of American agriculture and rural communities."

Agricultural economists are calling this a "generational downturn rather than a temporary slowdown."

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IV. THE THIRD FORCE: POPULATION DECLINE

The demographic arithmetic is unforgiving. Global population growth peaked at 2.3% per year in 1963, dropped to 0.9% by 2023, and current United Nations projections show it could reach negative 0.1% by 2100. Two-thirds of humanity now live in countries with below-replacement fertility. By the end of this century, 183 of 195 countries and territories are projected to fall below the replacement rate.

China's Demographic Crisis and Agricultural Demand

The most consequential demographic story for global agriculture is unfolding in China. The country's fertility rate has fallen below one child per family. Population projections by Vollset et al. in The Lancet estimate China's population declining from 1.41 billion in 2021 to 730 million by 2100. China is the world's largest protein consumer and its largest agricultural importer. Every percentage point of population decline translates directly into reduced demand for the commodities that American farmers produce.

Skeptics will argue, correctly, that population decline is a decades-long force, not a two-year catalyst. But the agricultural impact is not simply about total headcount. It is about the compounding effect when population decline intersects with reduced per-capita consumption from GLP-1 drugs and policy-driven dietary shifts. China is experiencing all three simultaneously: fewer people…eating less per person…buying less from the United States.

The Self-Reinforcing Spiral

Demographic decline cascades through the agricultural economy in ways that compound the other forces. Fewer working-age adults means a shrinking tax base to fund the farm safety net. Aging agricultural producers are exiting the industry; only 47% of U.S. cattle producers are even considering expansion in the next five years, down four percentage points from the prior year. The labor shortage in agriculture, already acute, will intensify as rural populations thin out. Meanwhile, larger operations absorb the acreage of those who exit, accelerating a consolidation trend that concentrates risk rather than distributing it.

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V. THE AMPLIFIERS: TRADE POLICY, MAHA, AND CONSOLIDATION

The core forces do not operate in isolation. Three additional dynamics amplify and accelerate their impact, transforming what might otherwise be a manageable cyclical downturn into a structural crisis.

Trade Policy Volatility

Through two administrations and two trade wars, the US-China trade relationship has been whiplash-inducing for American agriculture participants. Between June 2024 and June 2025, U.S. agricultural exports to China fell 39%. In March 2025, China allowed export licenses for hundreds of U.S. beef facilities to expire, and monthly beef exports to China dropped more than 90%, with Australian and Brazilian beef filling the gap. China hiked almond tariffs to 45%. Canada imposed 25% tariffs on $5.8 billion of U.S. agricultural products. The Farm Bureau noted that America's top three export markets, Mexico ($30.3 billion), Canada ($28.3 billion), and China ($24.7 billion in 2024), were all simultaneously targeted by retaliatory tariffs.

The November 2025 U.S.-China trade deal brought partial relief. China committed to purchasing at least 12 million metric tons of U.S. soybeans in the final two months of 2025, with a minimum of 25 million metric tons annually through 2028. But the deal's enforcement mechanisms remain untested, China has broken purchase commitments before, and the structural shift toward Brazilian sourcing may prove irreversible for a significant share of the market.

Meanwhile, input costs continue to climb. Fertilizer prices have risen 16% to 39% since January 2025, exacerbated by tariffs on Canadian imports. Farm labor costs are up 47% since 2020. The SHIPS Act will impose port fees exceeding $1.5 million on Chinese-made vessels calling at U.S. ports starting in fall 2025, and containerized agricultural exports are not exempt. U.S. agricultural exports for 2026 are forecast at $169 billion, the lowest in five years, with value declining 2.4% even as volume edges up 0.5%.

The MAHA Movement and Nutritional Policy Shifts

The Make America Healthy Again movement, led by HHS Secretary Robert F. Kennedy Jr., has evolved from a campaign slogan into an active policy apparatus that is reshaping the regulatory landscape around food. The MAHA Commission, established by Executive Order in February 2025, released its assessment in May, addressing poor diet, environmental chemicals, and overmedicalization. The 2025 Dietary Guidelines, issued January 8, 2026, feature a new inverted food pyramid, de-emphasize saturated fat limits, welcome full-fat dairy and red meat, and label refined grains and seed oils as "contributors to chronic inflammation."

The SNAP program is the movement's most direct lever on agricultural demand. Nebraska became the first state to receive a SNAP Food Restriction Waiver, followed by Indiana and Iowa, all effective January 1, 2026. The USDA has now approved waivers for six states, and eighteen

states will restrict SNAP purchases of candy and sugary drinks in 2026. The $50 billion Rural Health Transformation Program, created through the One Big Beautiful Bill Act, offers financial incentives to states implementing MAHA policies, including SNAP restrictions.

For the agricultural sector, the implications cut in multiple directions. MAHA policies may benefit producers of whole foods, fresh produce, and protein while disadvantaging processed food manufacturers and their upstream suppliers of corn, soybeans, and other commodity inputs. Roughly 35% of the American food industry, including Walmart, Hershey, and Nestle, has already committed to eliminating artificial dyes. California's legal definition of ultra-processed foods, combined with the FDA's plan to phase out synthetic dyes by the end of 2026, signals a regulatory trajectory that could fundamentally alter demand patterns for commodity agriculture.

More than 300 agricultural organizations have urged USDA, EPA, and HHS to ground future policies in science and consult farmers before making regulatory decisions. The National Corn Growers Association called the MAHA report "fear-based rather than science-based." The tension between MAHA's health-focused mission and the economic realities of commodity agriculture is real, and it adds a layer of policy uncertainty to an already stressed sector.

Consolidation Acceleration

The financial stress is accelerating the long-term trend toward fewer, larger farms. In calendar year 2025, 315 Chapter 12 farm bankruptcies were filed, a 46% increase over 2024 and the second consecutive year of rising filings. The Midwest saw a 70% increase, the Southeast 69%. Arkansas alone recorded 33 filings, more than double the prior year. Between 2017 and 2022, more than 140,000 farms closed in the United States, the vast majority under 1,000 acres. Another 5,000 were lost between 2022 and 2023.

The financial architecture behind these closures is revealing. Total farm debt is forecast to rise 5.2% to $624.7 billion in 2026. Nearly 40% more new farm operating loans were opened in Q4 2025 than the prior year, with average loan sizes 30% larger and maturities three months longer. Interest expenses are expected to hit a record $33 billion in 2026. Farm Journal Intelligence's predictive modeling found that 58% of small farms are "at risk" for sale or acquisition before 2030, and the risk of consolidation never drops below 27%, even for the largest operations. Nearly all agricultural economists surveyed in the Ag Economists' Monthly Monitor foresee continued or accelerated consolidation into 2026.

> *"Fewer larger farms and fewer larger crop service centers who provide farmers with supplies. Higher barriers to entry for young and beginning farmers. Dwindling political support for agriculture."*
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> *— Ag Economists' Monthly Monitor survey respondents*

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VI. THE DEVIL'S ADVOCATE: WHY I MIGHT BE WRONG

Intellectual honesty requires acknowledging the strongest counterarguments. Here are a few that I feel deserve serious consideration.

GLP-1 discontinuation rates are high. Real-world data shows that 64.8% of patients without diabetes discontinue GLP-1 medications within one year. A BMJ meta-analysis published in January 2026 found that patients regain weight at 0.4 kg per month after stopping, with all weight loss reversed after approximately 1.7 years. This suggests a revolving door rather than a permanent shift.

> **Rebuttal:** Discontinuations occurred when pharmaceutical supply chains were strained and access was limited. Moreover, GLP-1 discontinuation may limit the drug's individual impact, but in reality, it makes demand forecasting harder, not easier. A population cycling on and off appetite suppressants creates unpredictable purchasing patterns that food manufacturers and producers cannot plan for.

The beef market is historically tight, not oversupplied. At a 75-year inventory low, the U.S. cattle market defies the oversupply narrative. Quality continues to improve, with 84% of cattle grading Choice or above and 12% hitting Prime (I remember a time when Prime was a *"Statistical Anomaly"*). Consumer demand remains robust despite record prices.

> **Rebuttal:** This is a valid near-term counterpoint, but a lagging indicator: the industry will be rebuilding supply over the next decade into a market where structural demand forces are working against it.

Technology will improve efficiency. AI, autonomous equipment, and precision agriculture are real and advancing. McKinsey estimates AI can create $100 billion in on-farm value, and the autonomous equipment market is forecast to reach $128.4 billion by 2034.

> **Rebuttal:** Technology adoption in agriculture is measured in decades, not years. The convergence window will close long before these tools achieve sufficient scale.

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VII. WHY THE CONVERGENCE STILL HOLDS

The counterarguments are reasonable in isolation. They fall short when tested against the convergence itself.

The defining feature of this moment is not any single force. It is the simultaneous application of demand-side destruction (GLP-1 drugs, population decline, MAHA-driven dietary shifts), supply-side surplus (record grain stocks, Brazilian production dominance), and structural fragility

(record debt, rising bankruptcies, trade volatility). Every counterargument addresses one dimension while ignoring the others.

Many will look to the government to backstop the ag-economy, and the $44.3 billion in projected 2026 government payments proves the system still has political support. However, it is also the counterargument that most undermines itself. Record government payments are not evidence of system resilience. They are evidence that the system has already failed to sustain itself and is being kept alive through fiscal intervention. Every dollar of those payments is a dollar the market could not generate on its own.

The 1920s taught us that agricultural systems can appear resilient right up until the moment they are not. Farm income was strong in 1919. By 1921, it had collapsed. The intervening period was not marked by a single catastrophic event, but by the quiet convergence of forces that individually seemed manageable yet collectively overwhelmed the system's capacity to adapt. That is the pattern we are watching repeat.

> *"History doesn't repeat itself, but it often rhymes."*

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VIII. WHAT THE INDUSTRY SHOULD DO NOW

Prediction without prescription is an academic exercise. For the industry leaders reading this, the convergence demands concrete action.

For protein companies: Stress-test your business models against a 5% to 10% aggregate demand reduction over the next three to five years. Evaluate your exposure to commodity-dependent revenue streams and assess whether your customer base is concentrated in demographics with high GLP-1 adoption potential.

For producers: Evaluate your debt levels against an extended period of depressed prices. Consider whether current expansion plans are predicated on demand signals that may not persist. Hedge aggressively and build cash reserves rather than deploying capital into capacity that assumes a return to recent demand norms.

For the industry at large: Begin scenario planning for a structural shift, not just another cycle. Cycles have the ability to self-correct. Structural shifts are a product of various socioeconomic and geopolitical factors overlapping gradually until they collide at an inflection point. Can the industry recognize the convergence in time to prepare, or will we repeat the painful lessons of the 1920s, when optimism blinded an entire sector to the storm gathering on the horizon.

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