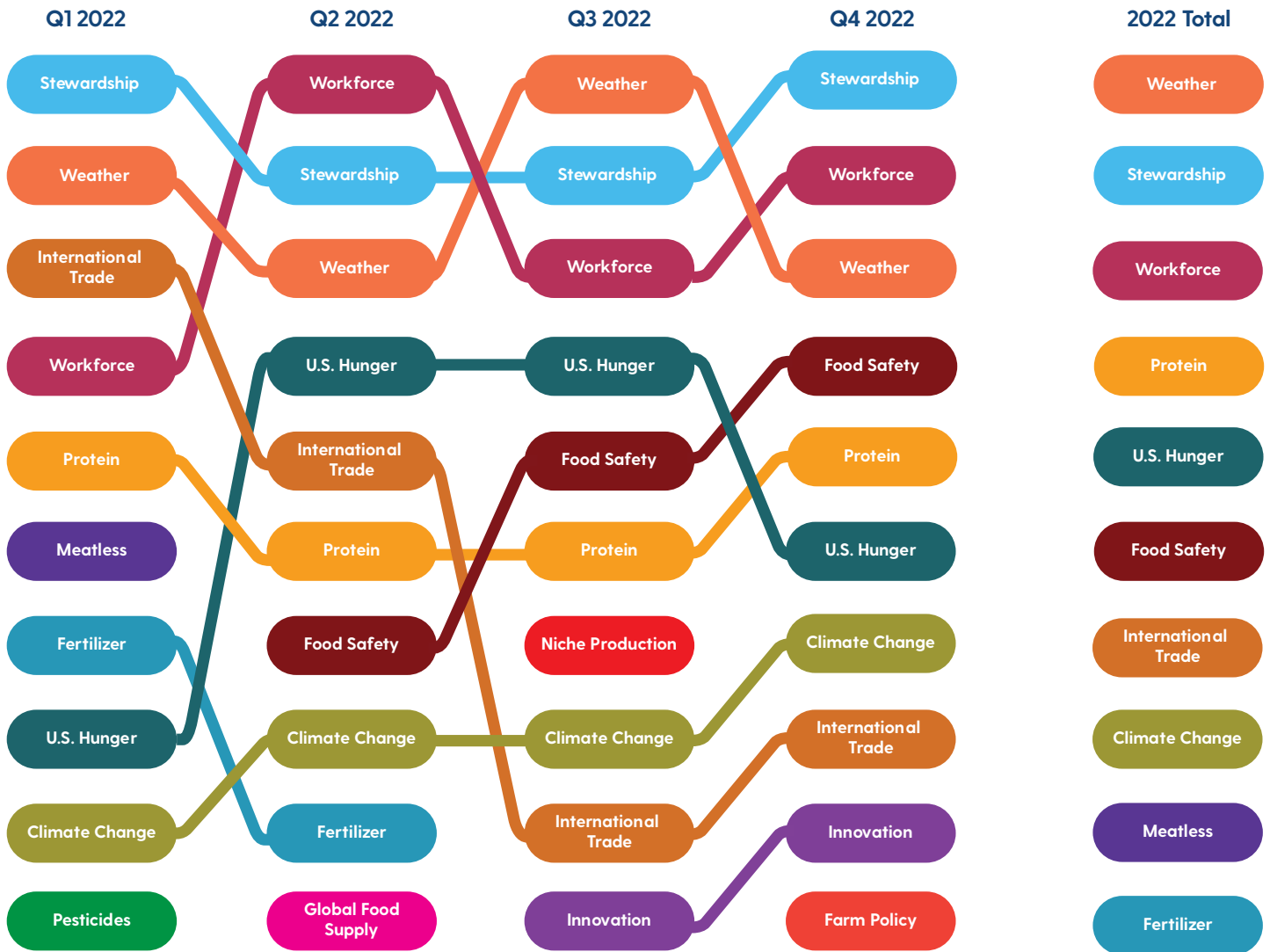


Supply Chain Stability, but at What Cost?

Top Ten Topics: 2022 Annual Report



In 2022, the impact of the coronavirus pandemic gave way to new disruptions in the form of extreme weather, worker strikes and Russia’s invasion of Ukraine. The year started out rocky, but companies adapted quickly and the supply chain stabilized for what felt like the first time in three years. Ultimately, all the disruptions along the way added up to one jarring figure: 8.3% inflation.

The trifecta of **weather**, **stewardship practices** and **climate change** all claimed spots in the rankings, led by concerns about the immediate and long-term impacts of drought and how farmers and ranchers ought to cope. Extreme weather events, ranging from heat waves to hurricanes, strained different parts of the supply chain and left a mark on price tags.

A short supply of labor empowered **workers** to demand higher wages. An outbreak of avian flu limited **protein** availability. Russia’s invasion of Ukraine interrupted **exports** from the fifth-largest grain producer. Sanctions against Russia hindered **fertilizer** availability. All these factors contributed to rising food prices.

The Biden administration vowed to fight these pressures by boosting support for **nutrition programs** and promoting competition in the marketplace. The meat and grocery industries have each been subject to scrutiny, and a proposed merger between Kroger and Albertsons has been contested in courts by several states.

1. Weather

Weather conditions and their effect on farming



Weather remained top of mind throughout the entire year as prolonged drought harried farmers and ranchers. Although the West bore the brunt of the strain, drought conditions affected at least 40% of the United States each week of the year and even [interrupted](#) barge

traffic on the Mississippi River.

The American Farm Bureau Federation [published](#) a survey of “ground-level” drought effects from Texas ranches to North Dakota grain fields to California orchards. Food Processing [tracked](#) higher tomato product prices. Farm Journal [tracked](#) the impact on corn and soybean production in the Upper Midwest; USDA [found](#) that nationwide production dropped by 8% for corn and 3% for soy compared with last year. In late-November, Reuters [shared](#) more USDA data showing that winter wheat crops were in the worst condition since tracking began in 1986. CNN [summed up](#) the gravity of the situation: “farmers are killing their own crops and selling cows.”

The New York Times [reported](#) that scientists have

declared the last two decades — often referred to as a “megadrought” — to be the driest in “at least 1,200 years.” Oklahoma State University Professor Derrell Peel [explained](#) in Feedstuffs that such broad metrics often mask rapid changes in local conditions.

Additionally, several extreme weather events damaged food production operations. A dozen tornadoes touching down in Iowa on March 5 [prompted](#) USDA to provide disaster assistance for farmers as well as [spurred](#) Sens. Chuck Grassley (R-Iowa) and Joni Ernst (R-Iowa) to introduce the TORNADO Act “to simplify and improve communication alerts.”

The University of Florida [estimated](#) that Hurricane Ian, which made landfall in Florida on September 28, caused as much as \$1.56 billion in damage to citrus, cattle and vegetable producers. Nation’s Restaurant News [detailed](#) damage to foodservice chains, [citing](#) the Waffle House index as a measure of the storm’s severity. In the wake of the storm, many organizations contributed to relief efforts, including [World Central Kitchen](#), [grocers](#), [meat processors](#) and the [USDA](#).

2. Stewardship

Environmental management of the land, water and air quality on and around farms and ranches



Stewardship practices remained top of mind for influential figures from farms to boardrooms, marking the 10th year in our top ten. In 2022, the Biden administration explicitly linked the environmental impact of food production with climate change policy. Perhaps surprisingly

to some, the focus on promoting farm stewardship practices has garnered praise from nearly every facet of the industry — academics, activists, agriculturalists and corporate boards alike.

“THE INFLATION REDUCTION ACT IS CAUSE FOR OPTIMISM FOR FARMERS AND RANCHERS ACROSS THE COUNTRY, WITH HISTORIC INVESTMENTS IN VOLUNTARY, INCENTIVE-BASED CONSERVATION PROGRAMS THAT ARE CRITICALLY UNDERFUNDED.”

— ROB LAREW, PRESIDENT, NATIONAL FARMERS UNION
[NATIONAL FARMERS UNION](#)

The National Association of the State Departments of Agriculture [shared](#) a speech from its president, Richard Ball, in which he [positioned](#) agriculture as “part of the answer” to climate change. Tech company Indigo Ag [distributed](#) its “first crop” of carbon credits for encouraging sustainable farming practices. Agriculturalists — from [The Dairy Alliance](#) to the [American Sugar Alliance](#) — reiterated the theme that “every day is Earth Day” for farmers, emphasizing how good stewardship practices help farms thrive long term.

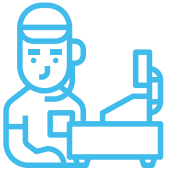
On World Water Day, March 22, [Coca-Cola](#) and [PepsiCo](#) announced plans to use less water than the companies replenish by 2030, while Keurig Dr Pepper [aimed](#) for “net positive water impact” by 2050. Burger King and Cargill [partnered](#) with the National Fish and Wildlife Foundation, donating \$5 million to target climate change on cattle ranches (Meat+Poultry).

But not every problem has an easy solution, and regulation of water use remains tricky. In October, the Supreme Court heard oral arguments regarding how the EPA defines “waters of the United States” under the Clean Water Act, at which point all 50 Republican senators [requested](#) that EPA halt current efforts to update the rule until the court rules. The agency [ignored](#) the request and issued its final rule on December 30, [earning](#) praise from environmentalist group Earthjustice.

Due to drought across the West, management of scarce water supplies served as a steady backdrop. The Associated Press partnered with local papers to [examine](#) the implications of miscalculations made in the Colorado River Compact when it was signed in 1922. In The Counter, Jessica Fu [explained](#) a USDA report showing that current irrigation practices will become less and less effective as drought continues. Additionally, Modern Farmer [covered](#) a Dartmouth study finding that crop yields may drop by 25% if Western states restricted groundwater use to match replenishment rates. Environmental Defense Fund [broke down](#) Texas’ \$80 billion water infrastructure plans, while Western Growers [highlighted](#) Arizona’s more modest \$1 billion investment.

3. Workforce

Pay, benefits and safety of workers



Concerns about the workforce catapulted to the top of our rankings during the first two years of the coronavirus pandemic, but 2022 proved to be a turning point for workplace safety rules. The Supreme Court [overturned](#) a Biden

administration vaccine mandate for employees at large companies on January 13. The National Retail Federation [welcomed](#) the ruling. A month later, the CDC [relaxed](#) mask-wearing guidelines.

A tight labor market outlasted these safety provisions, persisting throughout 2022. A smaller supply of workers gave rise to a surge in union activity. Kroger supermarket workers in Denver [negotiated](#) higher wages and benefits beginning January 25 (Business Insider). Albertsons [averted](#) an April 14 strike by offering United Food and Commercial Workers Union members in California a wage hike. Workers at a Michigan Chipotle Mexican Grill [voted](#) to unionize on August 25 (CNBC). And Starbucks stood head and shoulders above the rest, with 311 locations [filing](#) for union votes in the first half of the year (The Wall Street Journal). Starbucks Workers United [staged](#) a three-day strike across 100 locations beginning on December 16.

With the help of the Biden administration, 12 unions representing railroad workers [reached](#) a tentative agreement

on September 15 to avert a strike. However, by November 21, only eight of the unions ratified the agreement and the others threatened to strike at an estimated cost of \$2 billion a day. Industry groups — ranging from 204 members of the [Agricultural Transportation Working Group](#) to manufacturing-heavy [Consumer Brands Association](#) to the [National Retail Federation](#) — urged Congress to step in and impose the tentative contract. Congress approved the contract, and President Biden [signed](#) it into law on December 2.

Separate from union negotiations, California Gov. Gavin Newsom [signed](#) a law on September 5 establishing a panel with the authority to increase the minimum wage of fast-food workers. Service Employees International Union President Mary Kay Henry [welcomed](#) the opportunity for “550,000 fast-food workers a chance to sit down with government and their employers.” National Restaurant Association President and CEO Michelle Korsmo [warned](#) that the law threatened the viability of small businesses.

To mitigate rising labor costs, many companies are utilizing more automation in production, transportation and customer service. Walmart [announced](#) a partnership with DroneUp to offer drone delivery in six states. Nation’s Restaurant News [surveyed](#) contactless dining options. And FMI, The Food Industry Association, [looked at](#) benefits of automation in online grocery sales.

4. Protein

Protein as a nutrient and its role in human diets



Protein continued its streak as the most-discussed nutrient of the year. The nutrition studies that provoked discussions proved to be a mixed bag: both [red meat](#) (Tufts University) and processed [plant-based proteins](#) (Alt-Meat) were linked to heart disease. But most

conversations shifted away from how much protein to eat and toward the affordability of protein foods.

The Biden administration and members of Congress singled out consolidation in the meat processing sector as a prime factor in price spikes at the beginning of the pandemic. The administration [announced](#) a \$1 billion investment to support independent meat and poultry producers in January. At hearings in late April, House Agriculture Committee Chair David Scott (D-Ga.) [accused](#) beef packers of colluding on prices (Agri-Pulse) and Senate Agriculture Committee Chairwoman Debbie Stabenow (D-Mich.) [pushed](#) for building more resilient markets. The National Cattlemen’s Beef Association [welcomed](#) a transparency-focused bill that passed in June, but the North American Meat

Institute [objected](#) to provisions for a special investigator as “expanding the government with new, redundant offices and authorities.”

Avian influenza plagued the poultry industry over the course of 2022. USDA statistics [showed](#) that fewer commercial flocks suffered outbreaks during the summer, but cases crept back up as wild birds spread the disease along migration routes in the fall. Iowa State University professor Yuko Sato [outlined](#) how the severity of the disease affected Thanksgiving turkey prices. Feedstuffs [reported](#) that egg prices would climb as well after outbreaks in December raised the casualty count to 56 million birds across 46 states — [surpassing](#) 2015 as the most deadly bird flu outbreak (CDC).

On May 26, the USDA [announced](#) a series of updates to the Packers & Stockyards Act to boost competition and transparency in packer-farmer relationships, particularly for poultry producers. National Chicken Council President Mike Brown [objected](#): “The performance-based structure of how chicken farmers are compensated is literally the definition of competition.”

5. U.S. Hunger

Food-related welfare policy and food insecurity in the United States



Food insecurity rates climbed over the course of 2022 as inflation rates pinched already-tight budgets and an infant formula shortage further strained resources (see more in the Food Safety section). A July Feeding America survey [found](#) that 90% of its member

food banks had steady or increased demand and 70% received fewer donations. Polls from NPR, the Robert Wood Johnson Foundation and Harvard University [revealed](#) that Black, Latino and Native American households faced food insecurity upward of 50% more often than white households. The uptick in hunger [contrasts](#) a 20-year low achieved in 2021 (USDA), which The Washington Post's Laura Reiley [linked](#) to the end of child tax credits and other pandemic assistance programs in early February.

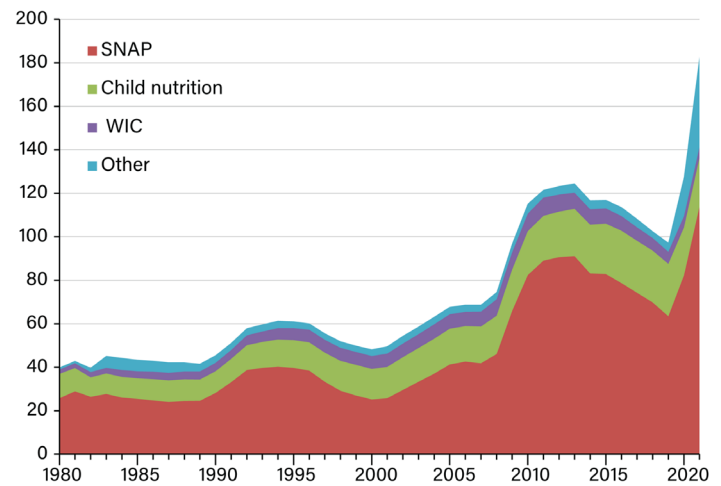
On September 28, the Biden administration hosted the White House Conference on Hunger, Nutrition and Health for the first time since 1969. A plan [released](#) ahead of the conference included expansion of school meals and incentivizing produce purchases with Supplemental Nutrition Assistance Program benefits. The conference drew broad support, with groups such as Chicago Council on Global Affairs, Food Systems for the Future, Tufts University's Friedman School of Nutrition Science and Policy and World Central Kitchen [developing](#) recommendations. Politico's Meredith Lee Hill [noted](#) that political realities may impede policy expansion.

One such test came in the 2023 budget bill that U.S.

Congress [passed](#) on December 23. The bill permanently expanded access to the summer meals program, which Feeding America [called](#) "a critical step forward." At the same time, Food Research & Action Center [raised](#) concerns about a "hunger cliff" with the sunset of emergency nutrition assistance. Earlier budget discussions around these programs [prompted](#) Sen. Debbie Stabenow (D-Mich.) to address the importance of the issue in the 2023 Farm Bill.

Inflation-adjusted spending on USDA food and nutrition assistance programs, fiscal years 1980-2021

Billions of 2021 dollars



USDA ECONOMIC RESEARCH SERVICE

6. Food Safety

Foodborne illness: related recalls and regulation



Food safety proved to be a fraught topic over the past year as more discussions revolved around FDA's lackluster oversight than on actual outbreaks of foodborne illness. The inciting incident came in February, when four cases of *Cronobacter* — two of them fatal — [prompted](#)

the FDA to halt the operation of an Abbott Nutrition infant formula facility in Michigan. A recall of affected products resulted in a monthslong shortage of suitable infant formula due to consolidation that Bloomberg [attributed](#) to stringent rules around participation in the Women, Infants and Children nutrition program.

In Politico, Helena Bottemiller Evich [broke news](#) that the FDA had been warned about the outbreak four months prior to the recall. Evich also [penned](#) an in-depth dive on FDA's failure to act sooner and kicked off a full-scale review of the agency. Congress held hearings on the topic in July, at which Sarah Gallo of Consumer Brands Association [emphasized](#) that slow responses from FDA hurt businesses as well as consumers. Rep. Rosa DeLauro (D-Conn.) and Sen. Dick Durbin (D-Ill.) [proposed](#) that FDA split its food and drug regulation, creating a "Food Safety Administration" under the

Department of Health and Human Services.

Congress commissioned the Reagan-Udall Foundation to evaluate the FDA. On December 6, the group [found](#) that unclear leadership and a lack of urgency meant that food often got put on the back burner. Food Safety News [noted](#) that industry and activist groups alike supported agency reform.

"THE FOOD PROGRAM IS ON THE BACK BURNER. ... THERE'S NOBODY REALLY PUSHING VERY HARD TO GET [THINGS] DONE IN THE SAME WAY THAT YOU'RE PUSHING VERY HARD TO GET THE COVID VACCINES OUT THERE AND AUTHORIZED. WE DON'T HAVE THAT IMPERATIVE AND THAT PRESSURE."

— STEPHEN OSTROFF, FORMER ACTING COMMISSIONER OF FDA ([POLITICO](#))

Separately, the USDA Food Safety and Inspection Service (FSIS) [proposed](#) a framework on October 14 to reduce poultry-based *Salmonella* infections. Consumer Reports [welcomed](#) the change, while Tom Super of the National Chicken Council [accused](#) FSIS of "formulating regulatory policies and drawing conclusions before gathering data."

7. International Trade

Imports and exports of food and agricultural products



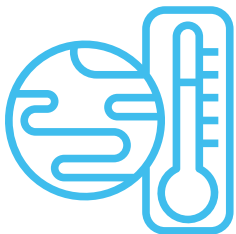
Global food and agricultural markets suffered immense disruption in 2022 due to Russia's unprovoked invasion of Ukraine. The war had immediate impacts on food prices, as Russia [cut off](#) wheat and sunflower oil supplies heading out of Ukraine and then

the United States retaliated with sanctions on Russian fuel and fertilizer (CNBC). In a speech on the resulting rise in global food insecurity, Secretary of State Antony Blinken [called](#) Russia's blockade "blackmail." The U.N. Food and Agriculture Organization [urged](#) other countries to not exacerbate the issue by limiting their own food exports. It was only in August that Reuters [confirmed](#) the first shipment to leave Ukraine. Over the course of the year, more than 1,000 global companies [withdrew](#) operations from Russia (Yale). Washington Post food critic Tim Carman [juxtaposed](#) the outflow with McDonald's 1990 entry into the market during the Cold War.

A series of other developments contributed smaller volumes of trade-related discussion. Mexico's \$3 billion avocado industry took a brief hit in February after the USDA issued a six-day suspension of Mexican avocado imports in response to a threat made to a U.S. plant safety inspector in Mexico ([Bloomberg](#)). The U.S. Senate [passed](#) the Ocean Shipping Reform Act on March 31. Agriculturalists, such as the [International Fresh Produce Association](#) and [National Pork Producers Council](#) thanked Congress. On May 23, the United States and 12 other nations [established](#) the Indo-Pacific Economic Framework. U.S. Dairy Export Council [lauded](#) the agreement, while The Economist [explained](#) the benefits of the framework even without defined trade agreements. USA Rice Federation [welcomed](#) WTO efforts to reduce Indian rice subsidies. At the end of the year, U.S. officials [negotiated](#) with Mexican leaders to address an upcoming ban on the import of genetically modified corn prior to a 2024 deadline (Farm Journal).

8. Climate Change

Current and predicted effects of climate change on food production



Climate change held the eighth spot in our rankings for most of the year, largely due to the Biden administration making agriculture a key component of its climate policy. And the administration has backed up its ambitions with cash. Agriculture Secretary Tom Vilsack [announced](#) a \$1 billion investment

on February 7 to help producers implement "climate smart" practices to reduce greenhouse gas emissions or sequester carbon and [followed up](#) with another \$2.8 billion of funds in September to research [soil health](#) (NCGA), [financial incentives](#) (Field to Market), [fresh produce](#) (IFPA) and many other projects. The Inflation Reduction Act [added](#) funding for the program, as did the 2023 budget, earning praise from an array of groups that ranged from the [American Farm Bureau Federation](#) (AFBF) and [National Milk Producers Federation](#) and [Soil Science Society of America](#) to the [National Council of Farmer Cooperatives](#) and [Environmental Defense Fund](#).

In March, the SEC [proposed](#) a rule that would require publicly traded companies to detail Scope 3 climate risks and greenhouse gas emissions. Agri-Pulse Associate Editor Steve Davies [wrote](#) that a July 1 Supreme Court decision on the EPA's Clean Power Plan could undermine

the SEC rule without a clear congressional mandate. Environmentalist group Sierra Club [supported](#) the rule for increasing transparency. Agriculturalists — including commodities groups representing pork, beef, soybeans, corn, cotton, potatoes, poultry and wheat — [argued](#) that reporting requirements would be too costly for small farms and would drive consolidation.

"WITH [THE INFLATION REDUCTION ACT'S] LANDMARK INVESTMENTS, WE ARE EQUIPPING FARMERS, FORESTERS, AND RURAL COMMUNITIES WITH THE TOOLS THEY NEED TO BE A PART OF THE CLIMATE SOLUTION, WHILE BOOSTING THEIR ECONOMIC SUCCESS AT THE SAME TIME."

— [SEN. DEBBIE STABENOW \(D-MICH.\)](#)

In July, a coalition of 218 environmentalist groups [petitioned](#) EPA Administrator Michael Regan to regulate concentrated animal feeding operation emissions under the authority of the Clean Air Act, Clean Water Act and Emergency Planning and Community Right-to-Know Act.

9. Meatless

Vegetarianism, veganism and substitutes for animal products



Meat alternatives once again drove discussions around vegetarianism, but the topic appears to be losing steam and failed to make the cutoff of our top topic rankings after the first quarter of the year. In late February, headlines included phrases like “Bleeding Out Profits,”

“Hit By Slower Sales” and “Takes a Beating” to [describe](#) how the category slumped after Beyond Meat missed its first-quarter expectations (The Financial Times).

“THERE IS SO MUCH COMPETITION AND IT’S A CROWDED MARKET — NO ONE EXPECTS ALL THESE BRANDS TO BE THERE IN 10 YEARS.”

— JP FROSSARD, ANALYST, RABOBANK
([THE WASHINGTON POST](#))

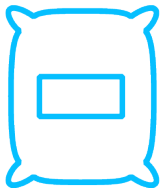
Nestlé Chief Technology Officer Stefan Palzer [told](#) Bloomberg that the market will likely see more sustainable

growth now that “overly optimistic expectations of consumer uptake” have been tempered. Indeed, companies continued to develop a plethora of plant-based ingredients and debut new products. Food Ingredients First [highlighted](#) the growing availability of non-soy proteins that fill functional or nutritional goals. Food Navigator [shared](#) SPINS data showing a 6.4% rise in dairy alternatives. NPR [tracked](#) a rise in availability of vegan ice cream products.

Our team tracked a steep decline in capital raised for plant-based meat alternatives, dropping under \$700 million from nearly \$2.1 billion in 2021. Meanwhile, companies pursuing cell-cultured proteins maintained momentum, with more than \$800 million of investments compared with \$1.1 billion the previous year. Of those, UPSIDE Foods [accounted](#) for \$400 million to scale its production up. The investment may pay off sooner rather than later, as Alt-Meat [broke news](#) on November 16 that the FDA [affirmed](#) the safety of UPSIDE Foods’ cultivated chicken product. While the cultured protein is not yet approved for sale, founder and CEO Uma Valeti called the letter “a watershed moment in the history of food.”

10. Fertilizer

Manure, nitrogen, phosphorus and other products that boost crop growth



Sneaking into the top topics for the first time in 2022, fertilizer earned attention in the fallout of the Russian invasion of Ukraine. Supply chain disruption in the form of sanctions catapulted soil nutrients like nitrogen and phosphate from humble inputs

to a potent source of cost inflation. CropLife America found that many U.S. farmers already had supplies for spring planting, but [noted](#) that the future held “plenty of questions and ‘black swans.’” World Bank [reported](#) a price hike of nearly 30% between January and May, following an 80% increase in 2021. Fortunately, markets appear to have moderated, with DTN writer Russ Quinn [observing](#) that “all eight major fertilizers are once again

less expensive [than the previous month]” for the seventh time in eight months.

High prices spurred adaptation and innovation. Reuters [addressed](#) rising demand for manure. GreenBiz [shared](#) a Yale e360 article on low-carbon “green ammonia” production. And The New York Times [distilled](#) another alternative into a catchy portmanteau: “peecycling.” USDA [announced](#) a \$250 million grant program in March to produce fertilizers domestically and [doubled down](#) with \$500 million in September. Modern Farmer [shared](#) research showing that black-eyed peas can substitute for nitrogen. AgFunder News [profiled](#) a startup that harnesses nitrogen-fixing bacteria. And researchers at UC Davis [pursued](#) gene-edited cereal crops that fix their own nitrogen.

Timeline: Events That Shaped 2022

While the Top Ten Topics highlight the biggest concerns in food production, the most salient events do not always fall neatly into a category and often bridge several topics. Here, we highlight the events that sparked the most conversations.

Date	Event
Jan. 1	Bioengineered foods labeling takes effect.
Jan. 13	U.S. Supreme Court overturns vaccine mandate for large companies.
Feb. 7	Agriculture Secretary Tom Vilsack announces \$1 billion fund to invest in climate-smart agriculture.
Feb. 17	United States blocks imports of avocados from Mexico after USDA inspector was threatened.
Feb. 24	Russia invades Ukraine, disrupting global food and agriculture trade.
April 26-27	Congress holds hearings on consolidation in the meat processing industry.
May 18	President Biden invokes Defense Production Act to boost infant formula production.
May 21	Jif recalls peanut butter products due to <i>Salmonella</i> contamination.
June 16	President Biden signs the Ocean Shipping Reform Act.
June 21	Kellogg Company announces a plan to split into three: snacks, cereal and plant-based foods.
July 22	Russia agrees to drop blockade of Ukrainian ports.
Aug. 1	USDA FSIS declares <i>Salmonella</i> an adulterant in some chicken products.
Sept. 5	California Gov. Gavin Newsom signs law to increase fast-food minimum wage.
Sept. 28	White House hosts food policy conference on hunger, nutrition and health.
Sept. 28	Hurricane Ian makes landfall in Florida.
Oct. 14	Kroger and Albertsons, the second- and fourth-largest grocers, propose a merger.
Nov. 6	Countries and corporations set climate change goals at the United Nations' COP27 summit.
Dec. 1	Congress votes to impose a contract on railroad workers after four of 12 unions reject a deal and threaten to strike.
Dec. 6	The Reagan-Udall Foundation publishes evaluation of FDA's shortcomings.

Wrapping Up the Year

Each year, we enjoy browsing through other groups' takes on the "greatest hits." Here are our favorite articles that look back on 2022 and predict 2023, covering topics from farmgate to plate.

Eater	The Hottest Trend of 2022: Worker Strikes
Nation's Restaurant News	20 restaurant industry mergers & acquisitions in 2022
Green Biz	From plan to progress — what 2022's women in food accomplished
Food Management	Top 10 K-12 food trends for 2023
Mintel	Global Food and Drink Trends for 2023
National Restaurant Association	Restaurant Guests Expected to Crave Connection, Value, and Convenience in 2023
Food Safety News	What's old is new again this New Year
Supermarket Perimeter	Gut health, diversity to be important to consumers in 2023
Agri-Pulse	Regs on the horizon in 2023: PFAS, WOTUS and more
Food Tank	123 Food and Agriculture Organizations to Watch in 2023