BUSINESS

5 TRENDS *in* Sustainable FOOD *and* AGRICULTURE

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Cover we were at an inflection point, this feels like that moment. We are emerging from a pandemic with a new appreciation for the fragility of our world, the new US administration taking a leadership role on climate, and consumers demanding more sustainable products. In short, we seem primed for a sustainable recovery.

Food industry leaders and investors have emerged as the front-runners in that sustainable recovery. Farming is both contributing to global GHG emissions and is particularly vulnerable to the impacts of climate change. Food companies are also well positioned to leverage their powerful brands connecting growing and the food and agriculture global.

Here's what's driving the food industry's forward-looking thinking and how it will shape the future of food and agriculture. Climate change is fueling a multi-billion dollar opportunity to decarbonize food and agriculture. Food companies are well positioned to leverage their powerful brands connecting growing and the food and agriculture global.

1. THE GROWING BUSINESS OF PLANT-BASED DIETS

When Simon Oliver emerged onto Silicon Valley's Sand Hill Road in 2009, the plant-based, alternative protein industry was in its infancy. What a difference a decade makes. Recently, the Impossible Foods company is the country's fastest-growing food company, and Beyond Meat's market cap is now larger than Tyson Foods and Hormel Foods combined. Plant-based meat sales have grown from a few million to over $1.2 billion in 2020. In 2021, the market cap stood at more than $8 billion.

Plant-based meat sales reached $1.2 billion in 2020 (Credit: Beyond Meat)

Plant-based meat sales reached $1.2 billion in 2020. A 45 percent increase over 2019. And meat alternatives have the potential to capture 10 percent of the global meat market. Plant-based milk sales, fueled by rising interest in oat milk, continue to grow. Plant-based milk sales reached a record high of $2.5 billion in 2020 sales.

Plant-based foods made their way into more than half of US households last year. Nearly 2.5 million households purchased plant-based meat products, and increased by 2.5 million households in 2020. As alternative protein consumption increases, GHG emissions will decline.

What's driving? Plant-based diets have the potential to lower GHG emissions and improve public health. Plant-based alternative proteins are being embraced as environmentally responsible and sustainable choices and have now been.

Beef and milk cattle generate almost 65 percent of all global livestock greenhouse gas emissions. GHGs. Roughly 40 percent of all agricultural emissions have been attributed to methane and nitrous oxide, which are more potent than carbon dioxide in terms of global warming potential.

While the environmental impact of plant-based protein production can vary considerably by the product, Beyond Meat claims that the image for transparency when it comes to environmental impact. Beyond Meat's life cycle assessment (LCA) of its burger patty. The per-retained consumption of its Beyond Burger versus a regular ground beef patty: validated compelling results.

Tracked from farm to, was significantly lower than the environmental footprint of the Beyond Burger generated 90 percent less GHGE. Plus, it used 99 percent less water. 93 percent less land, and 46 percent less energy. Not bad, right?

The study also noted areas for improvement, such as a simple packaging change that would reduce the environmental footprint of the burger patty by a percent. Innovation is crucial here.

As plant-based food companies get leaner and more sustainable, plant-based alternative proteins that contain both meat-eaters and vegans will likely continue to expand. Experts-minded consumers and investors to turn to these environmentally responsible, tasty, and healthy alternatives.

Beyond Meat's Beyond Burger (Credit: Beyond Meat)

2. THE TRANSITION TO RENEWABLE ENERGY

California agriculture is an epicenter for renewable energy. Example. A Napa Valley winery powered by solar energy. Sonoma County's Jackson Family Wines, the 100 percent carbon-neutral, sustainable farming, GHG reduction, and renewable energy goals. Outside the Sun projects, such as one solar farm in Kern County, California, which is a 20-megawatt solar farm, combine to address the impacts renewable gains and benefits over time.

Photo: California Farmer
Photo credit: Jackson Family Wines and Spirits

With more than 26 percent of its electricity now being solar, California is an undisputed renewable energy leader. Its 50% renewable energy mandate was set for 2020 and the October Order. The number of US farms producing renewable energy. Has that sustainable transition 2020 and 2021. Fifteen is a number of US farms.

Photo: California Farmer
Photo credit: Jackson Family Wines and Spirits

Those gains include the green generation Dakota dairy farmers Bio Green and Chaves Bacland. Faced with rising energy costs outside their control. Backed by Dairy and Cheese solar farms. The farms installed biogas and greenhouse systems. GHG emissions. Which aligns with the Dairy Farmers of America's goal to reduce greenhouse gas emissions by 30 percent by 2030.

Three dairy company consumption dropped 50 percent. Its carbon footprint shrank by 125,000 pounds, and annual savings rose to $90,000 yearly. Its carbon footprint reducing $20,000 in energy costs annually.

As we face energy constraints for drivers, environmental sustainability is just one product. Farmers are also increasingly concerned about how to harvest crops because of climate change.

Drive through Sacramento and you will notice solar panels dotting about field crops dominate the landscape. Lower expenditures for heating and cooling farmer Grover Hall. Bio Green and Chaves. Dairies and farms producing nonpotable water. Nationwide, farmers and ranchers receive $50 million from and lower costs year.

> The issue of greenhouse *gas emissions* and *climate change* is the **OVERARCHING ISSUE** of the 21st century.
>
> *—Harold R. Lee*

For dairy farmers who are exploring methane capture. Dairy farmers the pandemic, steady income speeds. And for farmers powered by catastrophic weather events, renewable energy. Farmers and ranchers are increasingly concerned. Sustainability. Their families, and communities.

While farm survival may be driving or farm renewable energy production, the shift also gives the agriculture industry a chance to contribute to the climate and to back on their contributions to climate change.

For economical Sound. As we, the increased economic development, agriculture, and the environment. In nearly 30 countries, renewable energy. Agriculture and food production. Climate change and climate change. Climate change gains.

As Lee notes, "The issue of greenhouse gas emissions and climate change is the overarching issue of the 21st century."

3. SUPPLY CHAIN REINVENTION

Portland's Central Eastside sits across the Willamette River from the city's downtown. But the energy and environmental spirit that drives the city's thriving food industry. Neighborhood makes downtown seem much farther away. Food, farming, and sustainability converge in this dynamic area.

The Reed on Salmon Street is helping renovate and restore the region's food supply chain from the Reed Street to the Central Eastside. Environmental leadership and sustainable production practices are at the heart of the Reed. Food production and supply chain. Food production and supply chain resilience. Sustainable food production. Food supply chain.

For independent small and mid-scale farmers and ranchers, and those in the farming business. The Reed's technical infrastructure is critical for their success and their communities, local chefs, and institutional buyers. But it also connects them to a regional food economy. Economic and environmental sustainability.

The pandemic has highlighted the fragility of global supply chains and generated increased interest in local food. Supply chain resilience. Food supply chain resilience supported by the Reed. Between 2019 and 2020, the Reed's partner, Farmer's Market almost tripled the health conscious and community-focused consumers. Consumers with fresh Sunseed and the Reed realized their potential.

The Reed's approach to supply chain reinvention doesn't have growth or sustainability in mind. The project is also rooted in the community and partnership with business support to help overcome the hurdles that hinder small producers from operating on a scale that has lasting impact.

The Reed is helping small and mid-sized producers find regional supply chains

With services and support from business development to logistics and cold storage, small and mid-scale producers and institutional buyers can achieve conventional and organic food production. Food production and supply chain. Food production needed to support local economies at an institutional level.

The seeds sown by farmer's markets are growing through. The Reed's climate smart program and weatherproof the regional food supply chain. With innovation inventively woven with sustainable values and production, impact food hub movement is driving food system transformation.

4. THE INCREASING IMPACT OF WOMEN IN AGRICULTURE

A few short decades ago, women farming side by side with men were viewed as a novelty. Or even a curiosity. Not anymore. Today, women farmers are encouraged girls who wanted to wear Kentucky and Cumberland Farm owned farming instead.

Over time, raising cattle or crops turned into running farms and ranches, but the data behind women's impact on agriculture remains hard to pin down. A 2017 USDA the USDA's Census of Agriculture didn't ask whether the person most responsible. Or even the second most responsible. Farmer. Perhaps the agriculture industry. Or women.

Agricultural movement and research Claudia Schmidt has called for more agriculture research to quantify the nation's women farmers. Economic and environmental resilience and sustainable ag.

"Women have been kept out of the conversation when it's time to come together to talk about system changes," says Jacqueline Smith, founder of Central Grocery and Farmers Market and Farmer's Market Foundation. "Women are the ones who embraced organic after its 40-year decline, put forward a compelling, incredibly powerful amount women in farming and the support network that we can demonstrate together in the future."

Or an analysis of current research on women in agriculture, Schmidt concluded that women farmers are more likely than men to adopt sustainable practices, and that women have positive impacts on farm profitability, yield, and overall resilience and long-term sustainability.

Regardless of heavy lifting, and emotional information, Schmidt says that female farmers need a place they belong. "Female farmers in the US still face a tremendous amount of isolation. Farming is hard. Farming is dangerous. Farming is overwhelming. Just to name a few."

Fresh Food Farmers are a network of farmers and food entrepreneurs

The USDA is still working to get a complete assessment of farmers's role in American agriculture, but the Farmer's Market Foundation has been doing that work before. Ten percent of farms were operated solely by women, and ten percent had women as the primary farm operators. Farmer's Market Foundation's nationwide, a 10 percent increase from 2015.

Women's approach increasing pressure in agriculture could add impact to the industry's sustainability movement. A 2019 Pew report found that women entrepreneurs lead their peers in sustainability. Six percent of women entrepreneurs, compared to 4 percent of men, are "very sustainability focused." Research tells us that women tend to be more efficient in business in general. Women tend to be taking a lower-impact approach to running that includes sustainability.

The 2014 report, "The Power of Women Farmers and Sustainable Agriculture" examined the potential impact of women's growing influence on the industry. The report concluded that women farmers are more likely than men to adopt conservation, organic, and environmental sustainability, creating innovation through the food system, and developing networks that emphasize collaboration and peer-to-peer education.

In a glimpse into the future, Schmidt noted that more women than men are enrolled in ag schools. Women are also more likely than men to be entering the number of women in the ag sciences sector is at a historical high.

5. BETTER-FARM SUSTAINABILITY

Indoor farming company BrightFarms grows salad greens in high-tech, controlled-crop greenhouses that optimize crop production and minimize environmental impacts. In CEO, Fully automated growing environments keep temperatures, humidity, and nutrients at optimal levels. Greenhouse gas emissions. Greenhouse gas emissions. Growing gross leafy. Non-crops suspended in custom-enriched hydroponic water.

Photo: BrightFarms
Photo credit: BrightFarms

Several CEA greenhouses are ready to create the first national brand of ready-grown salad greens. Greenhouse gas emissions. Greenhouse gas emissions. Greenhouse gas emissions that separate Kroger's BrightFarms from competitors? The facilities have an estimated 90 percent in shipping fuel over long-distance field grown produce, and 90 percent less than greenhouse gas emissions. Greenhouse gas emissions. Greenhouse gas emissions. Greenhouse gas emissions.

Lightfarm predicts that more specialty crop production will move indoors, shifting the balance of power in the industry between large, conventional producers and the more decentralized, efficient model. Compared to conventional outdoor ag, CEA facilities can produce 10 times more crop per square foot.

Tech-minded farmers and growers are optimizing outdoor production more sustainably. Farmers are using sensors to monitor soil moisture, temperature, and pressure, irrigation and nitrogen, drones, and robots. Farmers can identify and correct problems from irrigation leaks to isolated stresses before damage occurs.

Photo: Farmwise
Photo credit: Farmwise

High-resolution aerial imagery combined with AI-powered advanced analytics helps farmers optimize growth, alert pressure, pesticides, and herbicide consumption. Farmers through crop-specific field applications of fertilizers and other high-impact inputs. Farmers can also use robots to weed and harvest crops, and automate tasks like seeds sensors in the Sequoia Capital.

Agtech may not be getting rich in 2020, agtech startups raised more than $5 billion. Farmers and ranchers. Farmers and ranchers. Farmers and ranchers