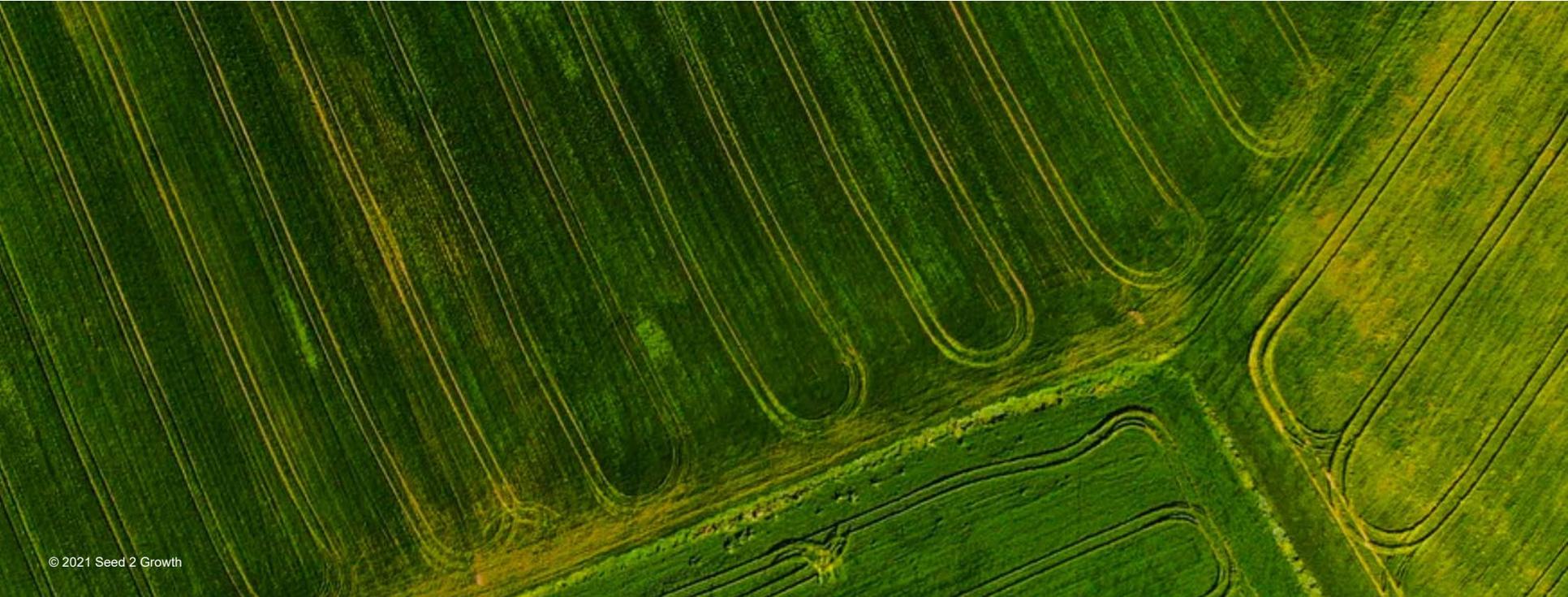


S2G Ventures

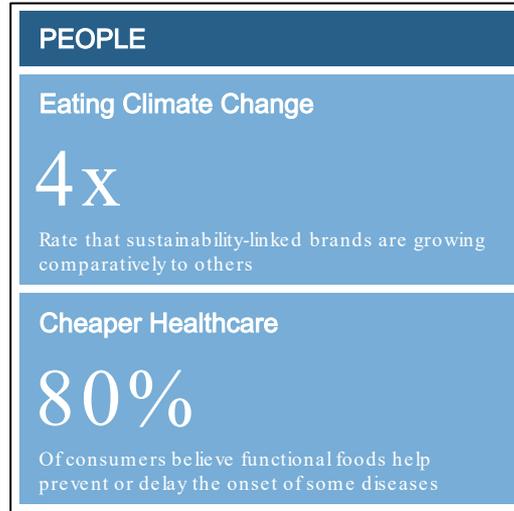
Healing America – A Future Food System for our Farmers, Consumers and Planet



A Food System that Heals— Our Country, People, and Planet

Everybody eats.

This simple truth positions the food system to solve complicated problems – from bridging the urban and rural divide in the United States to providing profitable solutions to addressing climate change. It can also help to build a more resilient, healthy population, which is paramount in the times of a public health crisis.



Source(s): S2G Research, [Farm Flavor](#), [Soil Health and Carbon Sequestration in US Croplands: A Policy Analysis](#) by Léopold Biardeau, Rebecca Crebbin-Coates, Ritt Keerati, Sara Litke, and Hortencia Rodriguez, [Institute of Food Technologist](#)

S2G Ventures

Founded in 2014. Located in Chicago and San Francisco.

We invest holistically
from soil to shelf.

\$700M

Of managed capital across seed, venture, and growth stage companies across the food chain

\$3.0B

Of capital catalyzed and added to the system overall outside of direct S2G investments

100%

Focused on sustainable food and ag investing as one of the largest and most active venture and growth funds in the industry

We back and support
trailblazing entrepreneurs.

50+

Portfolio Companies

5

Countries

Select Portfolio Companies



We act as a hub – convening
diverse partners and perspectives.

250+

Co-investors including
40 corporates

250+

Strategic relationships
with key players in
food production,
processing, and
retailing

Select Partnerships



\$125mm partnership between S2G and CDPQ to invest in **climate friendly food and ag entrepreneurs**

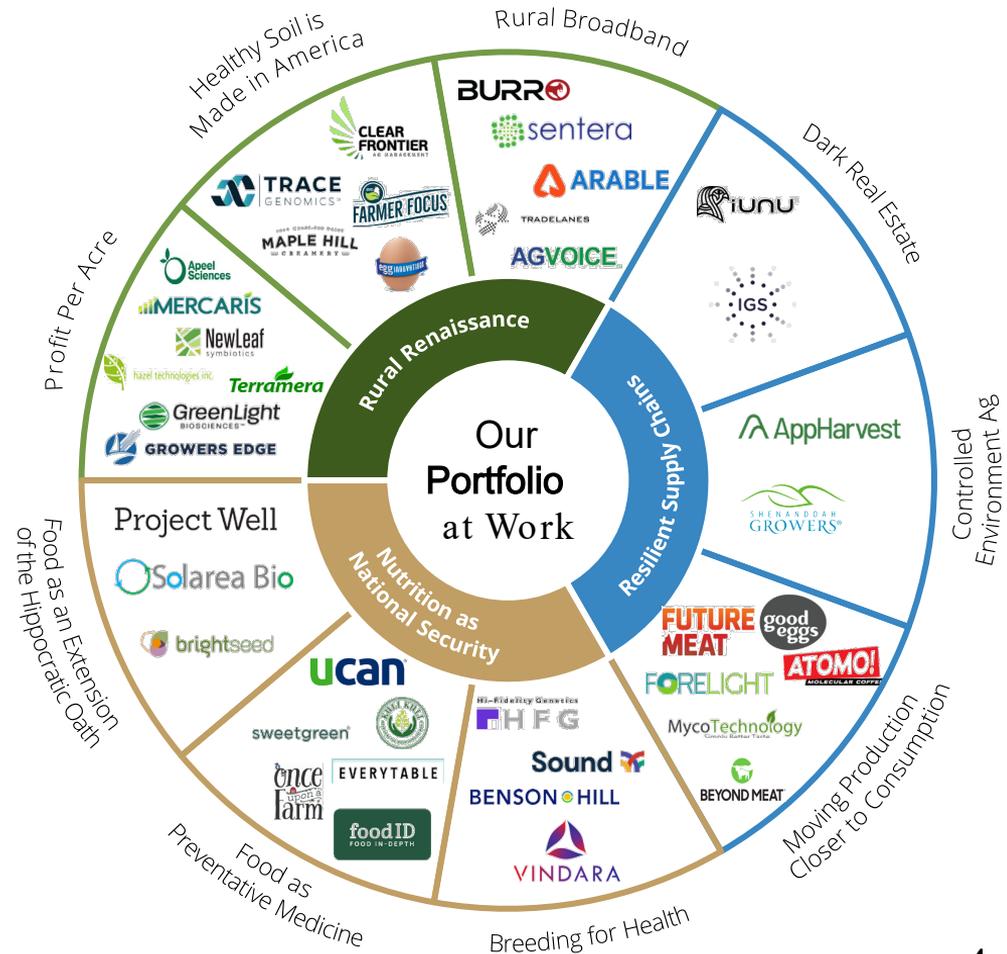
A movement already underway ... that can be accelerated with policy

Consumers, entrepreneurs, scientists and farmers are creating the biggest transformation in the Food System since World War II. Science is transforming the computation, biology, physics, and chemistry of food production – helping design a system that is healthier and more sustainable for consumer and more profitable for farmers.

Across the S2G portfolio, companies are hard at work to build the future of food and agriculture:

- \$9 billion in food and ag tech start-up funding in 2019. This represents 0.5% of risk capital invested as a percentage of Gross Output GDP, compared to 3.1% in financial services, 3.6% in healthcare, and 12.8% in information technology
- S2G challenges private markets to join us in catalyzing \$10 billion of additional investment in Food and AgTech innovation over the next 3 years to close the current funding gap and build a 21st-century global food system that is more resilient, healthier, and more sustainable

Source(s): S2G Research, Pitchbook, USDAERS



The Food System- Growing Transformation

The Farmer

Urgent Need to Increase Profitability with Sustainability

Farm Bankruptcies

20%

Increase during 2019, this number has been mitigated by \$37.2bn in Federal direct farm payments (2x> Auto bailout)

Data

8x

Increase in farm-level data generation on average in the next 10 years

Indoor Ag

3.5x

Growth in U.S. annual lettuce greenhouse production in the past 5 years

Soil Health

75%

Of land is substantially degraded with significant contribution from agriculture

Over the last decade, consumer's purchasing behavior with food has skewed towards a more complex set of questions, beyond price and taste, to include concepts such as ethics, source, environmental considerations, and the farmer.

Over a similar timeframe, farmers have continued to face a tight agricultural economy. Farmers are searching for stronger profitability, and while there has been an unprecedented growth in new agricultural technologies, adoption of promising new technologies remains low.

The Consumer

Younger, Healthier and more Digital

Younger

72

Million millennials in the U.S., the largest consumer class in U.S. history

Access

59%

Year-over-year growth in food and beverage sales through U.S. retail ecommerce

Clean Label

6x

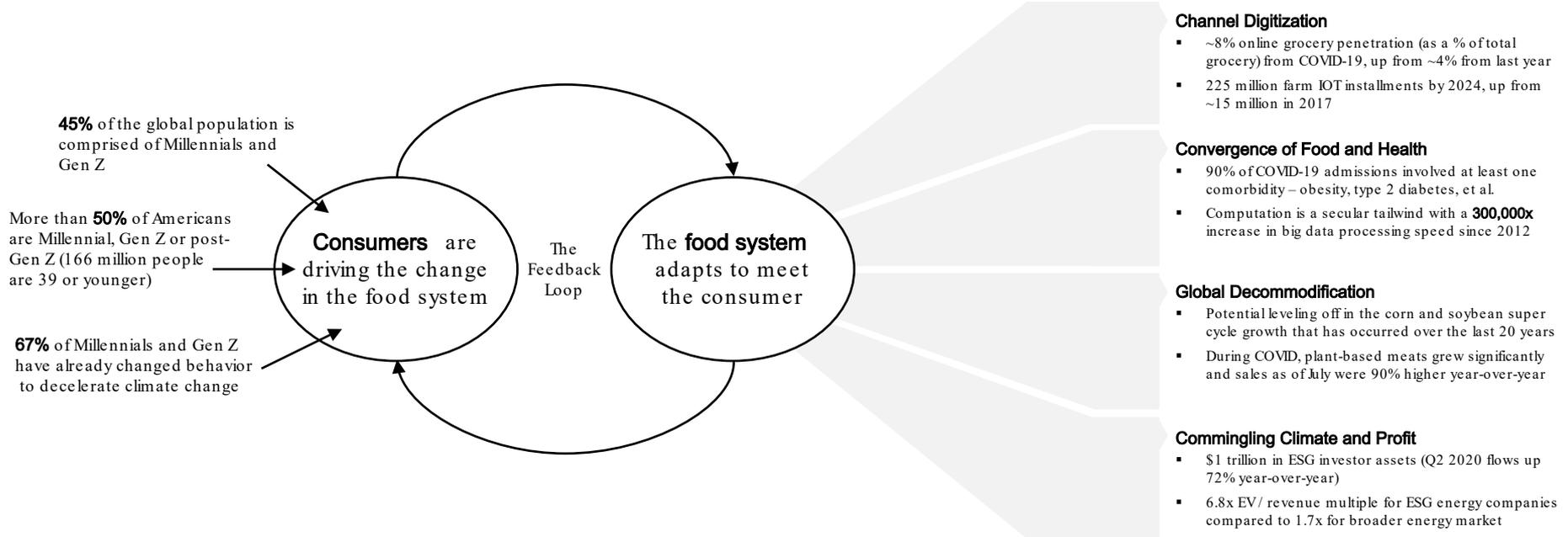
Growth of clean label products compared to conventional

Assurance

90%

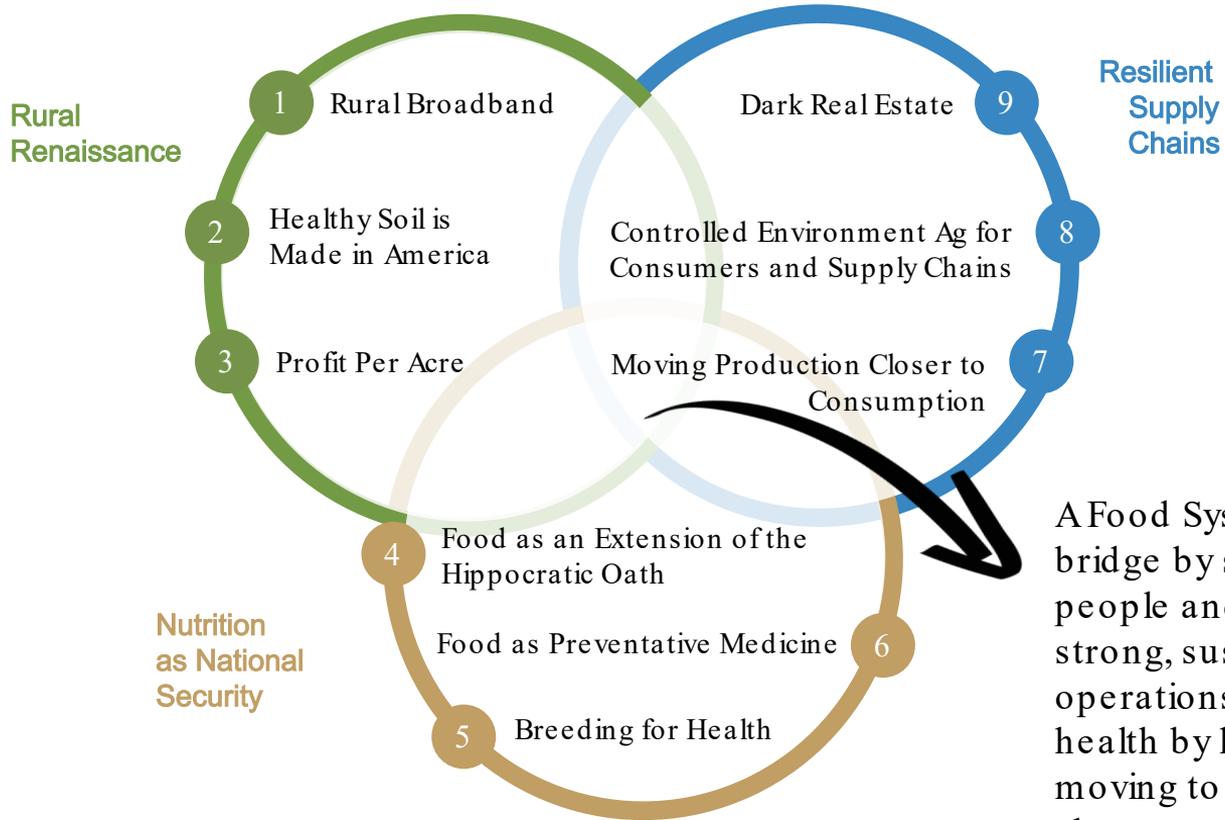
Of Top 100 CPG Brands losing market share

Post COVID, the Food System is Accelerating this Transformation



Source(s): S2G Research, [Brookings](#), [Food Dive](#), [McKinsey](#), [Gartner](#), Centers for Disease Control and Prevention, "Morbidity and Mortality Weekly Report", April 8, 2020, [OpenAI](#), [Morningstar Research](#), [YPulse](#)

Pillars of a Future Food System



A Food System that can serve as a bridge by supporting healthy people and communities, fostering strong, sustainable farm operations, and promoting climate health by helping farmers profit by moving to the front line of climate change.

Rural Renaissance



1 Rural Broadband

Gaps in broadband...	... impact rural communities' economic potential...	... and expose fragility in many parts of America
<p>1 in 4</p> <p>Rural Americans do not have rural broadband coverage, according to the FCC</p>	<p>2x and 3x</p> <p>Digitally-connected business earn 2x revenue per employee and are 3x more likely to create jobs</p>	<p>2,300+</p> <p>During COVID-19, free Wi-Fi locations offered by the American Connection Project Broadband Coalition</p>
<p>Top 10?</p> <p>By some analyses, the U.S. does not even rank among the top ten countries with the fastest broadband speeds</p>	<p>1 in 5</p> <p>Rural businesses only use basic digital tools, likely due to challenges of limited broadband coverage</p>	<p>3x</p> <p>The digital economy is growing roughly 10% per year, nearly 3x as fast as the overall economy</p>
<p>Access solves for ...</p>	<p>Resilience</p>	<p>Dependability</p>

Policy Considerations

By strengthening rural broadband infrastructure to ensure internet connection for all Americans, the country will be better prepared to deal with future crises.

Increased funding to bring broadband connectivity to all communities and improve mapping of broadband coverage, including improvements that are geared to meet community-level needs and demand, is a sound investment that will help connect communities across the country and solidify their economic opportunities.

The White House should lead and improve federal agency coordination efforts to ensure robust investments in broadband projects and mapping are effective for communities.

Source(s): S2G Research, [FCC Speed Test](#), [Deloitte](#), "Unlocking the Digital Potential of Rural America" by American Innovators, [Farm Bureau](#), "Measuring the Digital Economy" by Bureau of Economic Analysis

1 Rural Broadband – What It Means For Farmers

Data

As agriculture goes from data poor to data rich, it enables precision and digital agriculture technologies.

While internet access and connectivity issues extend far beyond agriculture, it is a key enabler of technology that allows farmers to:

- Reduce costs through better insights on key areas such as weather, crop health, and disease detection
- Identify the 'how' and 'when' for key decisions, such as irrigation and fertilizer application
- Enable on-farm decisions to improve profitability and yield

8x+

Increase in farm-level data generation on average over the next 10 years

Access to Capital

Real-time decision making has been limited when it comes to addressing financial resources and tools.

Connectivity and data would provide the technology to allow farmers the ability to provide on-farm, in-season transparency to lenders for differentiated cost of capital access:

- In the U.S., capital access for farmers is largely based on leverageable asset ownership - the farm or farm equipment
- Enable a more efficient manner of cash-flow based lending on rented acres for more productive operations
- Support innovative financial technology tools

54%

Of U.S. cropland is rented versus owned, according to the USDA

Risk Management

Farming is managing risk – production, market, financial, institutional, and operations.

While not all risks can be solved, connectivity may improve the management of key agricultural risks:

- Data transparency for Federal Crop Insurance providers to forecast the end of the season risk (loss reserving value, claim adjustments, yield loss estimates, et al.)
- Innovative risk management tools for farmers to better allocate resources, labor, and time throughout the season
- Producers benefit when there is data available to help determine accurate loan rates, disaster payments, and other financial information

~10%

Of corn and soybean farmers traded in futures contracts

2 Healthy Soil – Made in America

For most Americans, their house is the most important asset that they’ll ever own. For farmers, it is the soil. Soil provides a reservoir of water and nutrients and allows farmers to understand the health of their field visibly or through scientific means (level of nutrients to pH levels).

At the same time, USDA NRCS has estimated the total cost of erosion due to agriculture costs \$44 billion per year, while globally the planet has lost half of its topsoil in the last 150 years. By building better soil, profitability and wealth can return to the American family farmer.

Farmer Wealth

Investing in soil health, and other long-term conservation practices, may further align landowners and renters to maintain better land stewardship practices

Deteriorating soil health accelerates the price disparity between the underlying asset price of the farm and farmland productivity

Farmer Profitability

Growing soil organic matter and improving other soil characteristics may increase the crop yield

Fully functioning soil has the maximum crop production at the lowest cost, but erosion impacts compaction, loss of soil structure, nutrient degradation, and soil salinity

American Made Soil Health

Policy Considerations

From a policy perspective, government should invest in programs and services that make it easier and more profitable for farmers to practice conservation. Developing datasets that de-risk and demonstrate the profitability benefits of implementing certain practice changes can ultimately support more widespread adoption of innovative conservation approaches, practices and systems.

The U.S. Department of Agriculture should establish a climate task force and ensure input from an advisory board representing a diverse group of private partners, including stakeholders representing venture capital and start-ups working on these issues. The private sector is a significant driver when developing tools at scale that producers will need to profitably implement improved conservation practices.

3 Profit Per Acre

By shifting from ‘Yield ’ to **Profitability** , farmers may focus on better outcomes that improve the profitability of their businesses, while simultaneously yielding better soil health and climate outcomes.

Traditional commodity markets are massive and efficient, but they are not incentivized by farmer profitability. At the same time, consumers are driving a significant demand in organic and other identity preserved (“IP”) products (grass-fed, free range, et al) at grocery retail. IP markets lack transparency, risk management tools, price discovery, and other tools to help farmers bring products to market.



One example of the profitability opportunity for farmers in IP markets: organic markets are growing 12x faster than conventional markets, but U.S. organic production is currently unable to meet that demand. Instead, a large percentage of organic ingredients are imported. There is a profitability opportunity for U.S. farmers to meet growing demand for organic ingredients.

Today, there are only small, niche markets where priced carbon exists as a revenue stream for farmers; however, carbon has the potential to become the next cash crop. It would allow farmers to access a new revenue stream that is not currently available to them, provide access to more liquid markets, and incentivize positive land stewardship practices from renters and owners.



With bipartisan support for the Growing Climate Solutions Act, there is momentum building for carbon farming at the federal level. However, for carbon farming to be a scaled practice, it needs to be viewed as real and credible by the industry, landowners, and operators.

Margin Protection for Federal Crop Insurance was introduced in 2016 and is one of the first risk management products designed by USDA’s Risk Management Agency to focus on insuring the farmer’s operating margin. Federal risk management has historically focused on yield and revenue for various very sensible reasons.



The private sector has increased its focus on profit per acre, thereby focusing on margin instead of revenue (price x yield), and is moving quickly by building new financial, digital, and precision technologies for farmers. This opens opportunity for the private and public sectors to work collaboratively to improve overall profitability of the American farmer.

An Ingrained ‘Yield’ Culture

Moving towards a ‘Profitability’ Culture

3 Profit Per Acre (cont.)

“ The principle challenge, to me, is changing the mindset from thriving on 300 to 500 acres , rather than just surviving on 3,000 to 5,000 . We all grew up thinking we were outstanding farmers, and we were successful because I produce 80-bushel beans. Now we need to think about I'm successful because I net \$200 an acre.

Ken Dallmier

President of Clarkson Grain
Company of Illinois

Nutrition as National Security



4 Cheaper Healthcare & Food as an Extension of the Hippocratic Oath

Current State of Affairs in Healthcare Spend	Consumer Bankruptcies Caused by Medical Issues	How Consumers Finance their Medical Necessities	Food as an Extension of the Hippocratic Oath
<p>\$3.5 trillion</p> <p>Spent on health expenditures; despite higher per capita spending the U.S. has relative lower life expectancy</p>	<p>66.5%</p> <p>Of all bankruptcies were tied to medical issues, either in cost or time away from work</p>	<p>60%</p> <p>Of the U.S. population must completely drain their savings in order to pay off medical debt</p>	<p>75%</p> <p>Of healthcare budget was spent on chronic disease, with a majority being nutritionally - related and preventable</p>
<p>1.5x</p> <p>Growth in healthcare spending compared to the growth of the GDP</p>	<p>~530,000</p> <p>Families across the country turn to bankruptcy each year because of medical issues and bills</p>	<p>1 in 10</p> <p>Adults delay medical care due to cost, with an average hospital stay costing \$15,734</p>	<p>80x</p> <p>ROI (medical savings per patient / food spend per patient) by prescribing food and education for diabetics ⁽¹⁾</p>
<p>Convergence of food and health may help...</p>	<p>Economic Issues</p>	<p>Redirect to More Productive Spending</p>	

Source(s): S2G Research, [Committee for a Responsible Budget](#), [Forbes](#), [CNBC](#), [Medical Economics](#), [Fighting Chronic Disease](#), "Prescribing food as a specialty drug", *New England Journal of Medicine Catalyst* 2018

4 Food as an Extension of the Hippocratic Oath – The Healthcare and Food Industries are Coming Together

Walmart and HumanaVitality Partner for First-of-its-Kind Healthier Food Program to Incentivize Wellness

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Kroger is Testing 'Food as Medicine' with Food Prescriptions for Customers

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HCSC and Blue Cross Blue Shield Institute team up on new healthy food delivery service

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Geisinger - Prescribing Food as a Specialty Drug

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Nestle Health Science acquires personalized medicine platform

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Source(s): [Walmart](#), [Supermarket News](#), [Med City News](#), [Geisinger](#), [Nutra](#)

4 Food as an Extension of the Hippocratic Oath

“

The concept of food as medicine isn't new, but it's largely anecdotal and under-delivers. We can actually translate food into medicine. We know what it takes to grow things that are clinically proven to be more nutritious for a very specific health outcome.

Really, the opportunity to bestow health and longevity to billions worldwide is not in the hands of the healthcare industry, it's in the hands of the food industry.

”

Sofia Elizondo

Co-founder & COO, Brightseed

Food

Both
industries
calling for
collaboration

Healthcare

“

It is unacceptable for anyone to suffer from poor health because they can't get enough nutritious food to eat.

The association between good health and healthy food is indisputable, and if we want to make our communities the healthiest in the nation, it is crucial that we connect people with the resources they need to achieve total health.

”

Bernard J. Tyson

Chairman & CEO, Kaiser Permanente

5 Food as Preventative Medicine

While drugs are focused on treatment of specific human health conditions, food and medical foods have proven to be effective means of managing and preventing specific issues – most prevalently nutrition - related chronic health conditions such as type 2 diabetes, obesity, and congestive heart failure.

There is significant opportunity for Congressional engagement to promote policies that support the use of food as a prophylactic treatment of extensive, nearly ubiquitous human health conditions.

Key Considerations in Healthcare	Key Considerations in Nutrition
<p>90%</p> <p>Of COVID-19 admissions involved at least one comorbidity – obesity, type 2 diabetes, et al.</p>	<p>1 in 10</p> <p>Adults meet U.S. federal fruit or vegetable daily serving recommendations</p>
<p>75%</p> <p>Of the healthcare budget was spent on chronic diseases, the majority being nutritionally - related diseases</p>	<p>+0.35 servings</p> <p>Of produce consumed per resident per day for each additional meter of shelf space devoted to fresh vegetables ⁽¹⁾</p>
Healthcare	Nutrition

Policy Considerations

Food as medicine’ would benefit from further research and analysis to better inform the Dietary Guidelines for Americans as it develops nutritional recommendations during its next process.

A stronger body of research could also be used to improve training for medical professionals, including nutrition training in medical school, as doctors are key trusted advisors when patients are seeking dietary and nutritional advice.

Enhanced coordination between federal nutrition research agencies and renewing a priority for nutrition at USDA’s premier competitive research arm, the Agriculture and Food Research Initiative, would signal its importance and encourage potential applicants to think creatively about innovation in this field of work.

Source(s): S2G Research, Centers for Disease Control and Prevention, “Morbidity and Mortality Weekly Report”, April 8, 2020, [Fighting Chronic Disease, CDC, Cambridge University Press](#)

6 Breeding for Health

Current State of Affairs

Consumer preferences are changing rapidly and are increasingly uncompromising around nutrition, price, flavor, and other attributes, which has led to an uplift in more conscious consumption. However, the current food system needs to keep up in its ability to meet these demands, including new agricultural and ingredient innovation.

Historically, breeding has been centered around input traits, such as making a crop more resilient to drought or pests. The next generation of breeding is beginning and will continue to focus efforts on output traits – nutrition, flavor, functionality, affordability, and other attributes of growing importance to consumers.

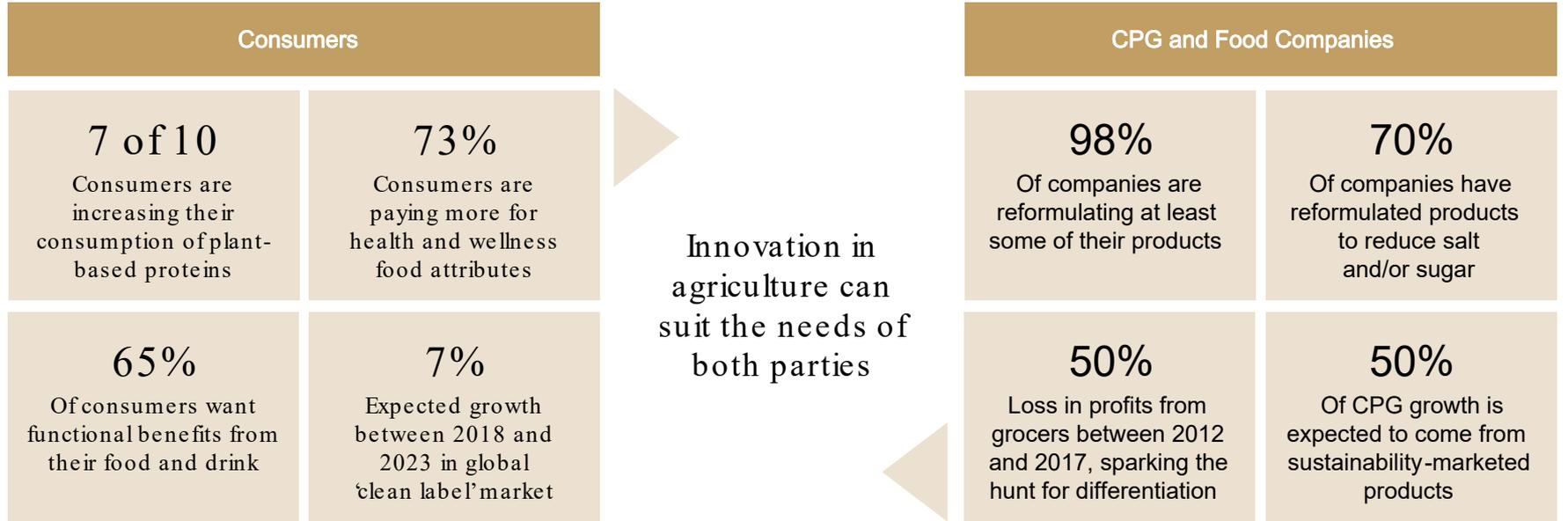
Policy Considerations

By creating a policy and regulatory environment that fosters innovation and new agricultural technologies, the U.S. food system will continue to be a leader among the world in ag innovation.

Congress and the executive branch must re-prioritize investments in the government's food and agricultural research agencies. Additionally, developing opportunities focused on ag technologies will push us towards future innovations.

The U.S. regulatory system should not impede the investment in and development of new technologies, such as gene editing, that will likely improve crop breeding for next generation traits by a magnitude

6 Breeding for Health (for People and Planet)



- Equity through affordable health and wellness traits
- Address food insecurity and malnutrition
- Improve challenged farm economics
- Increase production for growth in population

Benefits from consumers, agriculture, and CPGs coming together

Source(s): S2G Research, [Food Navigator](#), [Food Industry Executive](#), [Food Dive](#), [Business Wire](#), [PR News Wire](#), [McKinsey](#), [Refrigerated and Frozen Foods](#)

Resilient Supply Chains



7 Moving Production Closer to Consumption

COVID-19 meaningfully impacted the key pressure points in the food supply chain and caused fear across the supply chain – from agriculture companies to the consumer. It caused large food and agriculture companies to start rethinking their supply chain in an effort of improved resiliency.

The global food system has many perishable products, but it functions as a just-in-time economy where food inventories are intentionally kept at low levels. It causes vulnerability to unanticipated variations in demands.

With transportation system shutting down in the early days of COVID, three vulnerabilities that were exposed were:

- Food to retail distribution
- Agricultural inputs to farms (e.g., seeds, animal feed, fertilizer)
- Farm products to processors, packagers, spot markets, and exporters

The Supply Chain	The Consumer
<p>1,300 to 1,500</p> <p>Average miles food travels from farm to fork – the system is dependent on transportation over long distances</p>	<p>40-50%</p> <p>Decrease in distribution in retail between when the pandemic began and the middle of the year</p>
<p>25%</p> <p>Labor shortage would cause 49% reduction in food production, according to NISAC's⁽¹⁾ model</p>	<p>5%</p> <p>Negative impact on the U.S. pork supply from a single shut down from a major pork supplier's facility during COVID-19</p>
Resilience	Dependability

Policy Considerations

COVID-19 exposed risks in local, regional, and global food system that would benefit from further research into pressure points along the food supply chain.

During COVID-19, producers that sold into restaurant and food service locations faced a significant drop in demand when those establishments were forced to temporarily close. A more agile food system could benefit both producers and food service, by having the flexibility to redirect their product into grocery retail systems.

Policymakers should continue to increase financial support and incentives for local and regional producers, including those at FSA and Farm Credit. Examples include supporting barn finance for local egg producers or supply chains for local producers to sell into grocery or food service.

Note(s): (1) National Infrastructure Simulation & Analysis Center; Source(s): S2G Research, [ATRRA](#), [NISAC](#), [Reuters](#)

8 Controlled Environment Ag for Consumers and Supply Chains

Controlled environment agriculture can work alongside conventional methods to offer consumers and supply chain constituents more resilient, sustainable, local, high-quality products. By utilizing different methods and formats, indoor and greenhouse producers can alleviate systemic nutrition and food access challenges, while mitigating climate and other production risks. Further, controlled environment may alleviate logistical constraints of today's system.

In the future, controlled environments may demonstrably improve market access to affordable, high-quality, and nutritious produce. However, scaling controlled production will require collaboration and partnership across entrepreneurs, policymakers, scientists, and others critical in helping CEA reach a viable scale.

Policy Considerations

Controlled environment agriculture would benefit from further research, analysis, and focus from the USDA to help guide its trajectory and development in the future. A stronger body of research could also be used to inform crop advancement, energy and input cost, sustainability measurement, and other attributes of CEA.

Enhanced coordination and communication with specific federal agencies, such as the Department of Energy for lighting technology in controlled environment agriculture facilities.

We also support improving access to capital within USDA lending and risk programs for CEA.

Cumulative impact if vegetables and herbs shifted to ~13% CEA by 2025

U.S. food stakeholders largely stand to benefit, with notable positive externalities achieved over a five-year period.

Shift to Greater Localization		Reduced Resource Use + Waste	
2.3bn Additional production capacity (in lbs.)	9 Trillion-mile reduction in food miles	1.3 Billion of produce saved	330 Billion fewer gallons of water used

Source(s): S2G Research (Based on S2G Analysis and Market Assumptions)

9 Dark Real Estate

Tailwinds from COVID-19 include greater interest in controlled environment agriculture development and an increased focus on repurposing commercial real estate. At the same time, commercially, these technologies are becoming more viable and there is an opportunity to reimagine vacant real estate across urban centers as food production facilities.

Repurposing commercial real estate such as legacy manufacturing facilities and warehouses is an opportunity to promote jobs in urban areas, redefine “local” food systems, and optimize resource efficiencies. Creative approaches that leverage opportunity zones, private market participants and government bodies can help manage the infrastructure cost and deliver value across stakeholder groups.

Expanding commercial-scale agriculture production to urban and suburban areas is also additive to traditional, outdoor agricultural production. As discussed in the prior slides, it supports stronger controlled environment agricultural economics and offers a viable alternative to imports.

Source(s): S2G Research, [USDA Ag Census 2017](#)

While the hype of controlled environment agriculture continues to accelerate, greenhouse is an existing, large market opportunity with significant room to grow

Crops grown under glass or other protection	Number of Farms	Square Footage
Aquatic plants	331	1,308,064
Bulbs, corms, rhizomes, and tubers - dry	347	1,682,858
Cutting, seedlings, liners and plugs	1,356	37,173,863
Floriculture	17,051	869,496,529
Flower seeds	294	495,223
Greenhouse fruits and berries	846	11,708,439
Greenhouse tomatoes	7,974	63,929,576
Other greenhouse vegetables	7,198	48,634,529
Mushrooms	1,261	36,281,409
Nursery stock crops	4,302	308,879,616
Tobacco transplants	267	3,259,696
Vegetable seeds	599	8,972,753
Vegetable transplants	2,058	29,859,523
Total	43,884	1,421,682,078
<i>Average sq ft/farm</i>	<i>32,396</i>	

9 Dark Real Estate

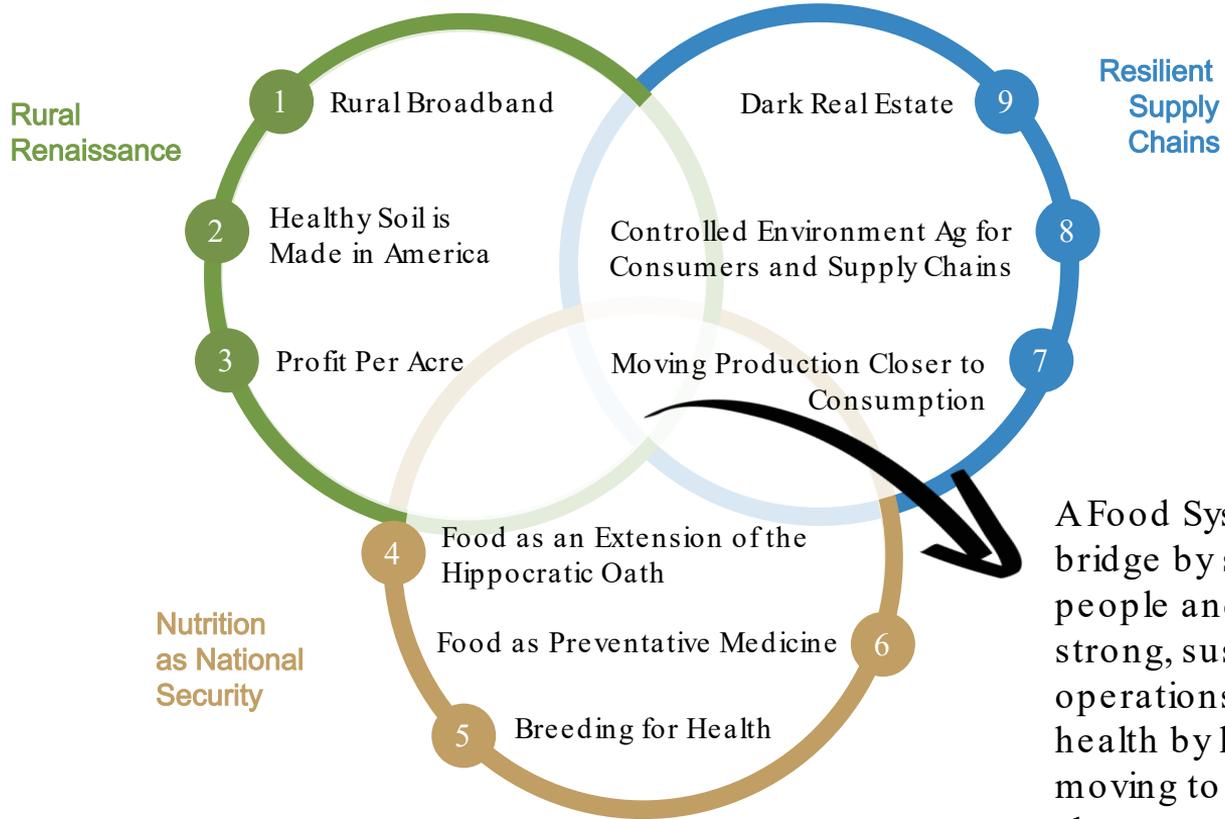
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Producing food without arable land constraints would provide numerous benefits including increased food production, particularly of fresh and local food; **employment opportunities for urban populations** , estimated to account for up to 75 percent of the global population by 2050; and the strategic use of soil resources for food production that is most suitable or necessarily must be soil-based.

**Ariel Kagan and
Jenna Riemenschneider** ,

Authors of Opportunities in Controlled Environment
Agriculture by the Food Institute at Swette Center for
Sustainable Food Systems at Arizona State University

A Future Food Systems That Doesn't Just Feed but Heals



A Food System that can serve as a bridge by supporting healthy people and communities, fostering strong, sustainable farm operations, and promoting climate health by helping farmers profit by moving to the front line of climate change.



Meet S2G Ventures

At S2G Ventures, we're harnessing the power of food innovation to create better outcomes for people and the planet. We believe food needs to be produced in a way that considers human and environmental health just as much as taste and profit – and we back trailblazing entrepreneurs across the food supply chain with the big ideas to make that dream a reality.

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Senior Associate

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Thank you.